

FLIGHT

The
AIRCRAFT
ENGINEER
&
AIRSHIPS

First Aero Weekly in the World.

Founder and Editor : STANLEY SPOONER

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport

OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM

No. 734. (No. 3, Vol. XV.)

JANUARY 18, 1923

Weekly, Price 6d.
Post free, 7d.

Flight

The Aircraft Engineer and Airships

Editorial Offices : 36, GREAT QUEEN STREET, KINGSWAY, W.C. 2

Telegrams : Truditur, Westcent, London. Telephone : Gerrard 1828

Annual Subscription Rates, Post Free :

United Kingdom .. 30s. 4d. Abroad .. 33s. 0d.*

These rates are subject to any alteration found necessary under abnormal conditions and to increases in postage rates

* European subscriptions must be remitted in British currency

CONTENTS

	PAGE
Editorial Comment	
France's Extending Air Lines	27
What Are We Doing?	28
Night-Flying	28
The Paris Aero Show, 1922	29
Gliding, Soaring and Air-Sailing	34
The Junkers' Monoplane	35
Aviation in Sweden	39
London-Continental Services	39
London Terminal Aerodrome	40
Personals	40
Royal Air Force	41
R.A.F. Short Commissions	41
Society of Model Aeronautical Engineers	42
Imports and Exports	42

DIARY OF FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in the following list :

1923	
Jan. 18	Lecture, "Flying Boats," by Maj. J. D. Rennie, before R.Ae.Soc.
Jan. 26	Lecture, "Wind Tunnel Work at the N.P.L.," by W. L. Cowley, before I.Ae.E.
Feb. 6-7	Third Air Conference at the Guildhall
Feb. 9	Lecture, "Seaplane Design," by W. O. Manning, before I.Ae.E.
Feb. 23	Lecture, "Aerofoils," by Dr. A. P. Thurston, before I.Ae.E.
Mar. 15	Entries close for Dutch Height Indicator Competition.
Apl. 12	Lecture, "Some Controversial Points in Aircraft Design," by F. T. Hill, before I.Ae.E.
May 11	Lecture, "Experimental Flying," by Maj. M. E. A. Wright, before I.Ae.E.
June 25-30	International Air Congress, London
June 30	R.A.F. Aerial Pageant
Aug. 6-27	French Gliding Competition, near Cherbourg
Dec. 1	Entries close for French Aero Engine Competition
1924	
Mar. 1	French Aero Engine Competition.

EDITORIAL COMMENT.



THE present lull in the work of the air lines, caused by winter conditions of fogs and low clouds, seems a good opportunity for having a look around, for taking stock of the situation and for making up our minds what we are going to do next. As in the years 1909 to 1913 or 1914, one soon comes

to the conclusion that France is the country which is at present pursuing the most vigorous aviation policy.

France's Extending Air Lines

We are not now referring to military aviation, but to civil aviation. In the former France took the lead long ago by deciding to devote large sums to the formation and maintenance of numerous air squadrons—so much so that one cannot view without certain misgivings the rapid expansion of her air arm. But that is not the side of French aviation with which we intend to deal this week. The subject we have in mind is France's civil aviation developments.

It is probably not realised in this country, certainly not outside aviation circles, that France is gradually spreading a network of air lines, not only at home, but even more so in her colonies, notably in Northern Africa. A regular service has long been in existence between Toulouse and Casablanca, operated by the Lignes Latécoère. The linking up of Toulouse-Marseille and Marseille-Paris is only a question of time, when Paris will be in direct aerial communication with Casablanca. A lateral or branch line has been established between Casablanca and Oran, and the next step is direct communication between France and Algeria. It had been hoped that the direct flight between Marseille and Algiers *via* the Balearic Islands might be possible, but as the oversea distance is rather formidable, it has been decided to lay the route *via* Toulouse-Barcelona-Balearic Islands-Algiers. In this manner the oversea distances have been reduced to about 125 miles, which should be well within the capacity of modern flying boats. It is expected that the distance between Toulouse and Algiers will be covered in rather less than seven hours.

Yet another line which is being gradually developed is that from France to Tunis. At present only the first stage, Antibes to Corsica, is in operation, but it

is expected that with the new Liore and Olivier amphibian flying boats the Corsica-Tunis section will be in operation during the present year. Probably calls would be made at Sicily *en route*.

As regards developments in French African air lines, it is intended to extend, during 1923, the line from Casablanca to Cape Juby, which is slightly less than half-way to Dakar. For 1924 the programme includes a further extension from Cape Juby to Dakar. Most of the work of surveying and organising this route has been done by Latécoère, who will operate the services.

Quite recently some Citroën motor-cars with caterpillar propulsion have succeeded in reaching Timbuctu. This feat has opened up possibilities of organising air lines from Colomb Bechar *via* Taourirt to Bourem, and hence to Timbuctu and Bamako in one direction and Bourem to Ouagadougou in another. The suggestion emanates from Gen. Estienne, in a recent interview. At the moment it is but a suggestion, but experiments are being carried out with the storage and carriage of petrol in special containers having double walls, and it is thought that other problems connected with such services are in a fair way of being solved.

The point is that France is showing herself keenly alive to the possibilities of air transport, while we—

* * *

What Are We Doing?

The question naturally arises, What are we doing in the matter of future developments? It is true that the British subsidised lines have been re-laid, and that they now cover routes to Holland, Germany and France, while a seaplane service is to be inaugurated in the spring between Southampton and the French coast. But is that enough? Is any permanent good going to be done by continuing to spend money upon short services which are never likely to be able to pay their way? To us it seems that, unless we decide that we can afford to organise services much farther afield, we had better decide that commercial aviation is not for us, that it costs a lot of money, and that there is no hope of it ever being able to "fly by itself." Only by increasing the length of the routes can we hope to make further progress, and to continue to spend

money on short routes is sheer waste. It would appear that the moment has come for us to decide. Which is it to be?

* * *

Night-Flying

Intimately connected with the question of the utility of commercial aviation is the problem of being able to fly by night as well as by day. Over short stages the gain in time is not so important, but over longer routes the capacity to fly by night has the effect of virtually doubling the speed of our machines. When we come to consider such routes as England to India, the saving in time resulting from night-flying is enormous, and is, in fact, so great that even if air transport is a good deal more expensive than other means it will be more than compensated for. It is therefore with satisfaction that we note that the night-flying experiments between London and Paris are to be resumed next month. There is still a very great deal to be learned, and a great many problems to be solved, but the gain to be expected is so tremendous that it should be well worth the expense.

While on the subject of night-flying, we cannot refrain from referring once more to an old theme of ours: seaplanes. While night-flying over land is and always will be a somewhat risky procedure, owing to the unknown nature of the country below, and will necessitate a fairly expensive organisation in the way of lighthouses, wireless service, etc., those best qualified to speak on the subject hold that in flying over the sea the danger is very much smaller, owing to the constant presence of an "aerodrome" below, while no special lighthouses are required beyond those already in existence for shipping. That being so, would it not be possible also to hold a series of experiments with night-flying over the sea? The problem appears to resolve itself to this:—Seaplanes should be more economical than land machines, as they are not required to compete in speed with anything faster than a steamer; they require no ground organisation beyond one or two direction-finding wireless stations; they offer less danger in the dark or in a fog. Why not, therefore, devote a little more of our time and money to a thorough testing-out of the seaplane?

□ □ □ □

Duke of York Betrothed

THE following announcement was made in the Court Circular on January 15, 1923:—"It is with the greatest pleasure that The King and Queen announce the betrothal of their beloved son the Duke of York to the Lady Elizabeth Bowes-Lyon, daughter of the Earl and Countess of Strathmore and Kinghorne, to which the King has gladly given his consent."

His Royal Highness is a Group Captain in the R.A.F., and is Personal Aide-de-Camp to the King. Obtaining his pilot's certificate in 1919, he was promoted to Wing Commander, and later to Group Captain—his present rank. In 1918, the Duke of York was on the staff of the Independent Air Force in France, and his first connection with aviation dates back to late 1917.

Apart from his good work in the R.A.F., the Duke of York is, perhaps, best known for the very practical interest which he takes in welfare work. As President of the Industrial Welfare Society, he has worked hard to promote a better understanding and greater confidence between employers and employed.

Malta Aerodrome Opened

ON January 16, Lord Plumer, at the request of Air-Commodore Charles Samson, C.M.G., D.S.O., A.F.C., Air

Officer Commanding R.A.F. Mediterranean, opened the Halfar aerodrome, Malta, in the presence of the leading Service and civilian officials. Lieut. Simpson, the officer in charge of R.A.F. works, stated that the aerodrome had been constructed not only for military use, but also in view of present and future developments in aerial communication. Malta might become a connecting-link in an all-red aerial chain, and full provision had been made for such a development. Lord Plumer formally opened the aerodrome by hoisting the Union Jack. Three flying boats flew over firing rockets and dropped a bouquet for Lady Plumer by parachute. The aerodrome is situated close to the existing seaplane base, so that when the need arises, arrangements can be made for re-fuelling, etc., of both land and sea types of machines.

Sir Percy Cox Flying Home

BEING urgently required to attend conferences with the Cabinet Committee on matters relating to affairs in the Middle East, Sir Percy Cox, High Commissioner of Iraq, is leaving Baghdad tomorrow (January 19) by air. His route over the Arabian desert will be that of the Cairo-Baghdad air service, *i.e.*, Baghdad-Ramadi-Kazr el Azrak-Amman-Ramleh-Heliopolis (Cairo). The ordinary journey would occupy at least 8 days, so that by making use of the air service, Sir Percy will save a whole week.

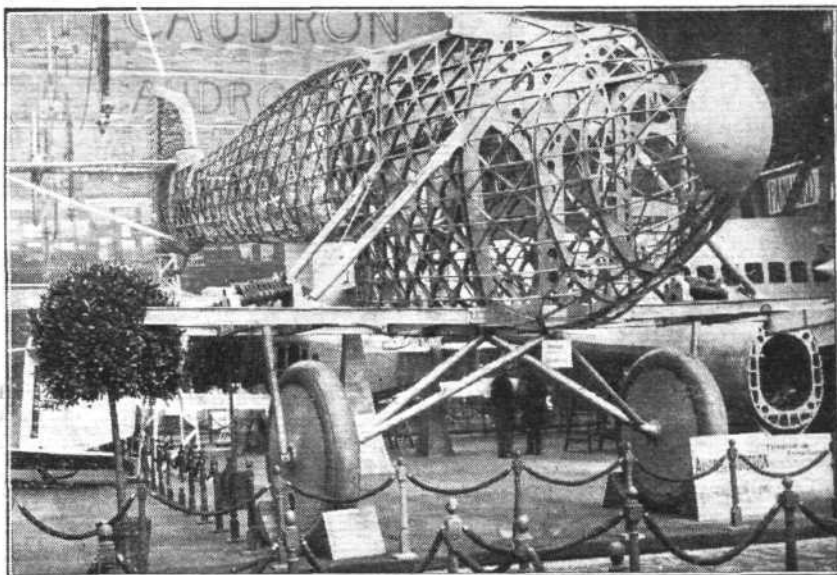


By THE TECHNICAL EDITOR

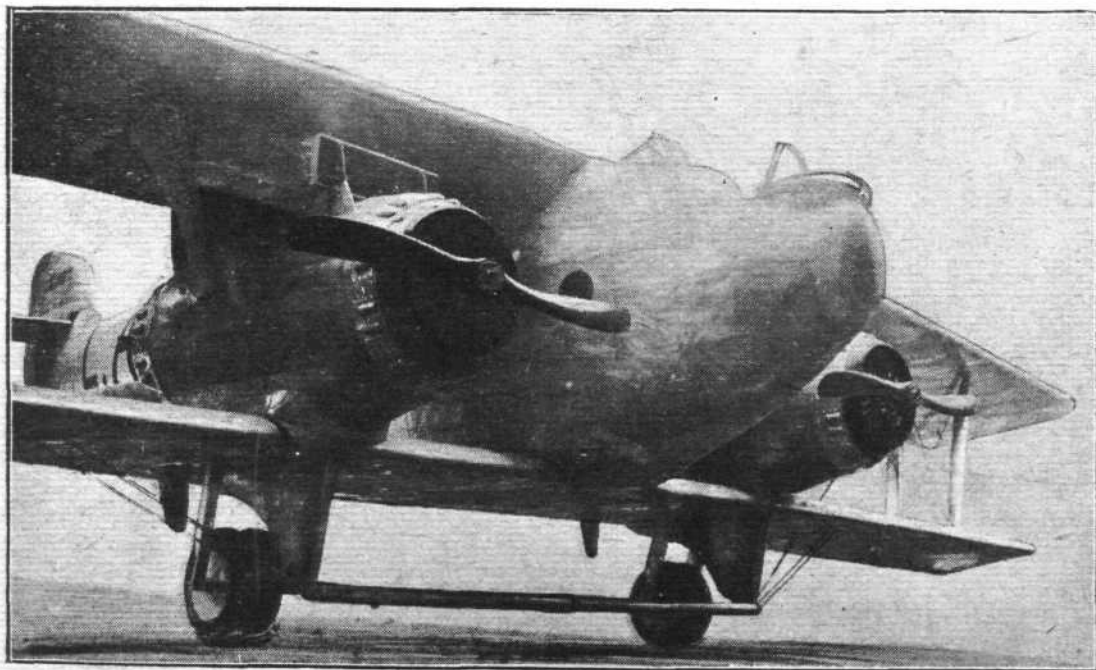
(Continued from page 22)

S. I. A. LATÉCOÈRE, Toulouse

ONLY one machine was exhibited this year by *Société Industrielle d'Aviation Latécoère*, but what the exhibit lacked in numbers it made up for in size. The Latécoère "L.A.T.6" is a huge four-engined bomber, with the 260 h.p. Salmson engines placed in tandem on the wings. The fuselage of this machine was exhibited at the 1921 Paris Show, when both its design and construction came in for considerable criticism. Nor is it probable that the critics, after seeing the finished machine, will have changed their views. To begin with, the tandem arrangement of engines has been found years ago to be bad aerodynamically, owing mainly to the fact that the airscrew of the rear engine is working in the slip stream from the tractor, and consequently has to have a greater pitch, as it is working in air of greater velocity. Secondly, the many projections on the machine must have a very adverse effect upon the efficiency, although if the advantages aimed at are attained, this price might not be considered unduly great. In the "L.A.T.6" the reasons have obviously been to provide gun platforms in positions where there was a good field of fire, so as to enable the machine to be independent of escorts for fighting off attackers.



THE LATECOERE L.A.T.6 : This photograph of the fuselage was taken at the 1921 Paris Show, and shows the peculiar construction. The undercarriage has been entirely re-designed since then.



The Latécoère L.A.T.6 : Front view of machine, showing nose of fuselage and also the new undercarriage, which should be compared with that of the photograph above.

The Giant of the Show : The huge Latécoère four-engined, all-metal biplane.



Thus there is a gunner's cockpit in the extreme nose, and another aft of the wings, formed by a projection shaped somewhat like the counter of a yacht, from which the gunner can sweep an entire semi-circle, or even slightly more.

Constructionally the Latécoère bomber is of interest mainly on account of the fact that it is built of Duralumin. In spite of its great size the L.A.T.6 has but one pair of inter-plane struts on each side, and this in spite of the fact that the engines are mounted on the wings. The wings are built up of a number of spars, of which the two main ones are double. These are of the lattice type, as are also the single auxiliary spars or stringers. The ribs are little more than flat bands passed over the main and secondary spars, being in fact of very flat trough section and serving mainly for the attachment of the sheet Duralumin covering.

The wing bracing is of interest on account of the fact that the lift wires pass through the lower plane from the undercarriage struts, and are attached at the top, not to the spars, as is usual practice, but to the large-diameter compression tube of the drag bracing. This tube passes through the centre of the spars, and by attaching to them the lift and anti-lift wires and inter-plane struts the fitting is considerably simplified. We have seen the same arrangement before, on, we believe, the Boulton and Paul all-metal two-seater shown at one of the Paris Aero Shows.

The undercarriage has been entirely re-designed since the previous Show, when the fuselage of the L.A.T.6 was shown with two short wing roots and the undercarriage struts passing through the lower plane, inside which the shock absorbers were housed. At the recent Paris Show the machine was exhibited with a very wide undercarriage, consisting of a set of wheels under each pair of engines. Triangulation was by means of the wing bracing, no transverse bracing being employed between the two halves of the undercarriage.

The main characteristics of the L.A.T. 6 are as follows:—Length, o.a., 51 ft. 8 in.; span, 84 ft.; height, 20 ft. 6 ins.; wing area, 1,300 sq. ft.; total loaded weight, 11,600 lbs.; wing

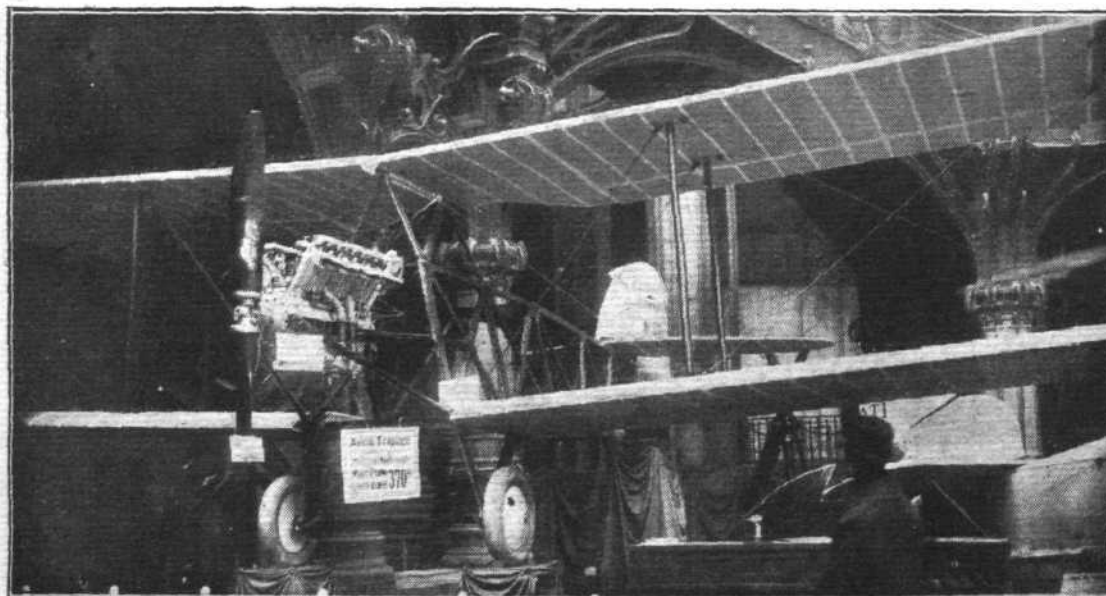
loading, 9 lbs./sq. ft.; power loading (1,000 h.p.), 11.6 lbs./h.p.; estimated speed near ground, 142 m.p.h.; speed at 13,000 ft. 133 m.p.h.

PIERRE LEVASSEUR, Paris

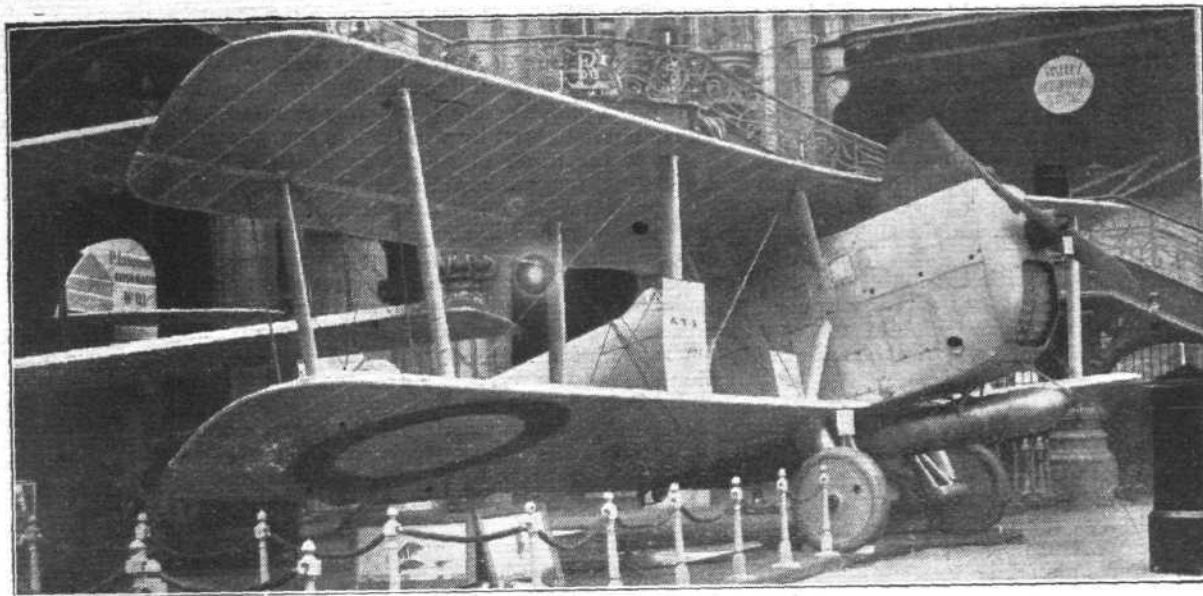
ONE of the first, if not actually the first, French firms to take up the design and construction of torpedo planes was that of Pierre Levasseur, whose managing director is M. Charles Frechet. It is not, therefore, surprising that again this year one of the machines exhibited was a torpedo plane, while the second was a Navy type biplane, fitted with an undercarriage whose axle and wheels can be dropped if the machine has to alight on the sea. In addition to the complete machines P. Levasseur exhibited several examples of the variable pitch airscrews which this firm has developed during the last few years.

The torpedo plane resembles in general outline the Blackburn "Swift," and, as a matter of fact, we believe that there is some working arrangement between the two firms by which the experience of one is made available to the other. Thus the P. Levasseur torpedo plane is obviously modelled upon, rather than slavishly copied from, the Blackburn machines, and conversely, we understand that the P. Levasseur variable pitch airscrews are being handled in this country by the Leeds firm. Having stated this, there is little need to go into great detail regarding the Levasseur torpedo plane, type A.T.1. The machine is largely constructed of steel tubing, the engine mounting and front portion of the fuselage being of this material. The engine fitted is a 600 h.p. Renault, and a wide speed range has been aimed at, not only in order that the machine may land more easily on the deck of an aircraft carrier, but also to facilitate the aiming and dropping of the torpedo. Needless to say, a divided undercarriage is provided in view of the torpedo carried, and flotation gear ensures that the machine will float if forced to come down on the sea.

The main characteristics are as follows: Length, o.a., 10.65 m. (35 ft.); span 15.25 m. (50 ft.); wing area 72 sq. m. (775 sq. ft.); weight empty, 2,150 kgs. (4,750 lbs.);



The Pierre Levasseur Navy Type: This machine has a very unusual fuselage construction, consisting of a few panels of multiply wood, and should be extremely cheap to build.

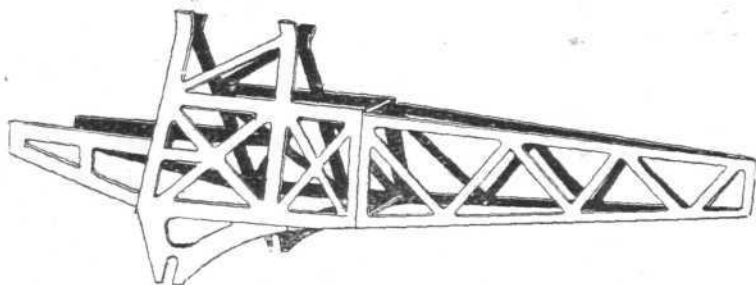


The Pierre Levasseur Torpedo Plane: Generally speaking, the design of this machine resembles that of the Blackburn "Swift."

useful load 1,150 kgs. (2,530 lbs.); total loaded weight 3,300 kgs. (7,280 lbs.); wing loading 45.5 kgs./sq. m. (9.4 lbs./sq. ft.); power loading 6 kgs./h.p. (12.15 lbs./h.p.). Maximum speed, 160 km. (99 m.p.h.); slow speed, 85 km. (52.7 m.p.h.).

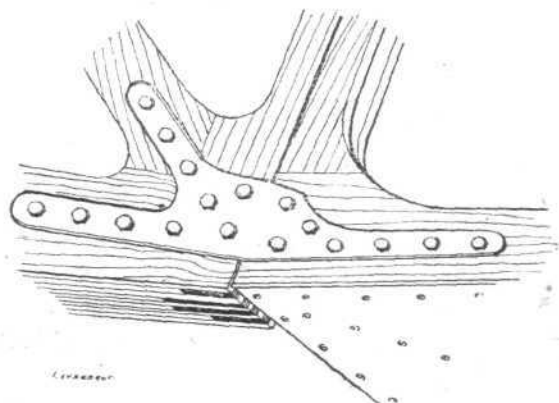
The second machine shown was a fleet spotter of unusual construction, at any rate as regards its fuselage. At the previous Paris Aero Show, it may be remembered, a three-seater touring machine was exhibited in which the rear portion of the fuselage was formed by two long narrow panels of multi-

ply wood. The fleet spotter may be said to be a development of that machine as regards its fuselage construction which takes the form of four panels made up from a number of layers of wood glued together and suitably triangulated so as to avoid the necessity for any wire bracing in the sides. The rear portion of the fuselage is formed by two panels, and the front portion, including the undercarriage vees, of another two, the structure being completed by half-a-dozen transverse struts with wire bracing. One objection to this form of construction is that in case of damage to a part an entire panel will have to be renewed. On the other hand, the construction is so absurdly cheap that this fact alone should entitle it to consideration. The panels are not glued up of solid sheets, cut out afterwards, but the various vertical and diagonal struts are joined to the longerons much in the same manner



THE PIERRE LEVASSEUR NAVY TYPE: Diagrammatic sketch showing panel construction of the fuselage.

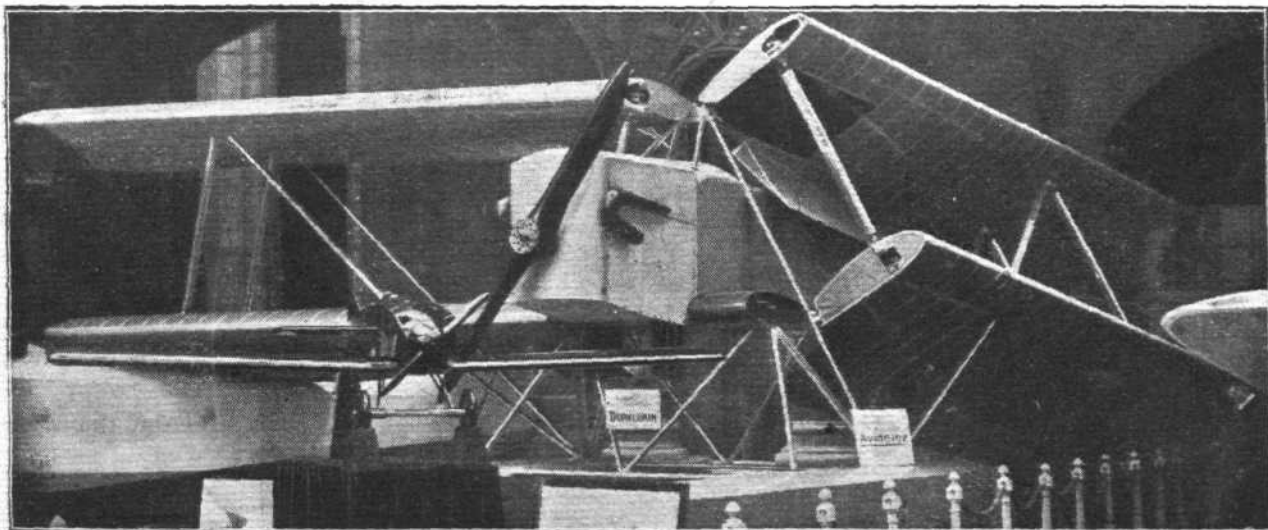
ply wood. The fleet spotter may be said to be a development of that machine as regards its fuselage construction which takes the form of four panels made up from a number of layers of wood glued together and suitably triangulated so as to avoid the necessity for any wire bracing in the sides. The rear portion of the fuselage is formed by two panels, and the front portion, including the undercarriage vees, of another two, the structure being completed by half-a-dozen transverse struts with wire bracing. One objection to this form of construction is that in case of damage to a part an entire panel will have to be renewed. On the other hand, the construction is so absurdly cheap that this fact alone should entitle it to consideration. The panels are not glued up of solid sheets, cut out afterwards, but the various vertical and diagonal struts are joined to the longerons much in the same manner



THE PIERRE LEVASSEUR NAVY TYPE: Detail sketch showing method of multi-ply construction of the panels.

in which the blades of a propeller are joined by overlapping the laminations. One of our sketches should make the principle clear.

The various panels are joined together by large steel plates and bolts, and as the taper is everywhere straight, the cross bracing joining the two sides together is simplicity itself. The machine is to be covered with three-ply so as to make it watertight, as it is intended for use over the sea, although not fitted with floats. The engine mounting, carrying a



THE LIORE AND OLIVIER TWIN-FLOAT SEAPLANE: Note the peculiar attitude taken up by the folded wings, owing to the angularity of the strut on which the wings are hinged. The wing section is Göttingen 430.

370 h.p. Lorraine-Dietrich engine, is of steel tubing, and forms an entirely separate unit.

As already mentioned, the undercarriage vees are formed as integral parts of the front side-panels, a feature which might be objected to on the score that damage to the undercarriage would necessitate the renewal of the whole panel. The axle is housed in an open slot in the bottom of the vees, and an arrangement is to be incorporated by means of which the axle and wheels may be dropped preparatory to alighting in the sea alongside the aircraft carrier, should this become necessary for any reason.

The wings are of ordinary design, with two pairs of inter-plane struts on each side, and do not call for any special comment. The top plane is in two halves, which attach to a cabane resting on, but built as a separate unit from, the front panels of the fuselage.

The fuselage construction of the Levasseur fleet spotter should be especially useful for cheap low-power sporting and touring machines, especially as we are informed that the structure is extremely light without the three-ply covering, which might well, for ordinary use, be replaced by fabric. For gliders also this form of construction would appear to have much to recommend it, especially the absence of metal fittings, or at any rate their reduction to a minimum. Thus for amateur construction the "panel system" would have the advantage of both cheapness and easy manipulation.

Following are a few data relating to the P. Levasseur fleet spotter: Span 14.5 m. (47 ft. 6 ins.); wing area, 58 sq. m. (623 sq. ft.); estimated speed, 180 kms. (111 m.p.h.)

LIORE AND OLIVIER, Levallois-Perret (Seine)

Two LeO machines were shown by this firm, one a twin float sea-plane intended for naval reconnaissance work and the other a cabin flying boat commercial machine. Of the two the flying boat was the more interesting, as similar machines are in daily use between Antibes and Corsica, where they maintain a regular service.

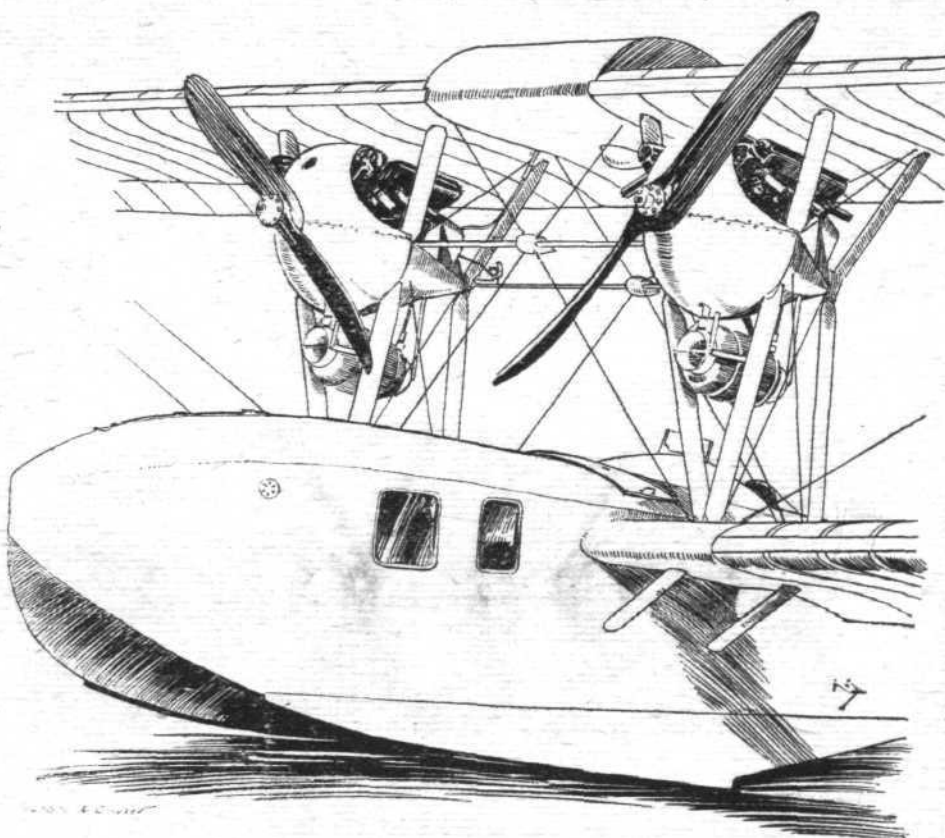
The LeO H.13 is a twin-engined flying boat with two Hispano engines mounted on Vee struts high in the gap and close together, so that it should be possible to fly the machine straight, with but one engine running, or at any rate greatly to prolong the glide and thus be able to come down near a vessel or near the coast, according to circumstances. The machine really bears evidence of being a serious attempt at evolving a truly commercial flying boat, and although certain features may not agree with our ideas, the LeO 13 is entitled to careful consideration.

The boat hull is of the flat-sided variety, with three-ply wood planking. It is divided into 7 watertight compartments, and has but a single step, occurring slightly aft of the rear

spar. The cabin has seating accommodation for four passengers, but if desired room can be provided for six or more. The cabin is entered through a hatch in the deck near the bows, and in the aft wall is a small door leading to a luggage compartment and to the pilot's cockpit, which is situated behind the wings. The cabin is lighted by windows in the side of the hull.

Aft of the lower plane the deck of the boat is raised into a flat sort of turret, and here is situated the seat for the pilot and navigator, or wireless operator. It seems probable that the view obtained is somewhat restricted by the fairly wide bows of the boat, and it might be expected that the slip stream from the tips of the two propellers would be somewhat inconvenient. We are informed, however, that pilots have expressed themselves satisfied both with the view and the general comfort, and certainly in case of a crash the pilot should stand a rather better chance than the passengers enclosed in the cabin.

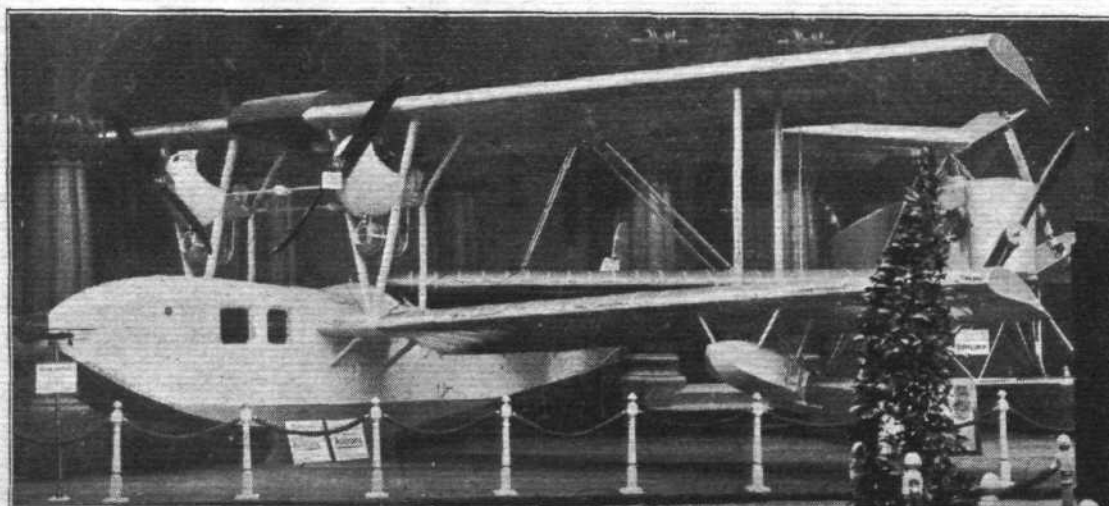
The wings are of Göttingen No. 430 section, and, with the exception of the engine struts, there is but one pair of inter-



Engine mountings and front of hull of LeO H 13.

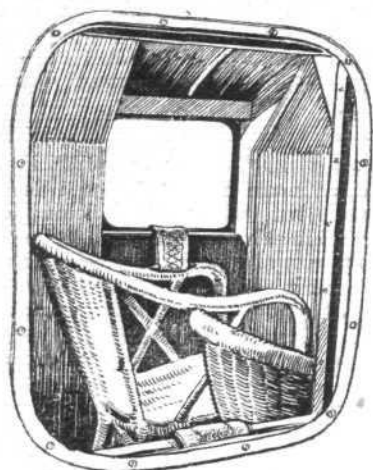
plane struts on each side. In view of the deep spars which can be accommodated in the Göttingen section, this is probably sufficient.

The two 150 h.p. Hispano-Suiza engines are mounted high in the gap between the planes, and their bearers are supported on Vee struts in front and Y struts to the rear spars. A



The Liore and Olivier Flying Boat: The two Hispano engines are mounted close together above the cabin. The pilot sits behind the wings.

single Lamblin radiator is mounted in the angle between the legs of the Vee struts, below the engine. The petrol tank forms a very deep top centre-section, and owing to the height



Looking through the windows into cabin of LeO H.13.

above the engines direct gravity feed can be employed, with consequent increase in reliability and reduction in piping and other weights.

(To be continued.)



A Greeting from India

LAST week, not too late to be welcome, came a Christmas and New Year's Greeting card, complete with photographic group, from the Warrant Officers, Flight Sergeants and Sergeants of the 20th Squadron, R.A.F., in Quetta, India. Our readers will, we feel sure, join us in reciprocating herewith these kind thoughts and in wishing them a speedy return "Home."

The Biard-Supermarine Records

Four more World's Records, to the credit of Great Britain, have been officially granted by the F.A.I. for the performances put up by Capt. Biard, on the Supermarine-Napier flying boat, in the Schneider Cup Race last year. These records are for 200 kms., 100 kms., duration and distance.

Air Companies Registered in 1922.

FROM the list of companies registered at Somerset House during 1922 compiled by Messrs. Jordan and Sons, Ltd., 116, Chancery Lane, W.C. 2, we note that out of the total amount of capital subscribed, £119,078,233 for 7,852 companies, only £4,000 is down for two "Air" companies.

Sir Samuel Hoare Visits Supermarine Works

ON January 15, Sir Samuel Hoare, Bart., C.M.G., M.P., Secretary of State for Air, paid a visit to the Supermarine Works at Southampton. Sir Samuel inspected several flying boats in course of construction, both for the Air Ministry and for commercial purposes, and the visit was of particular interest to him as it was the first occasion on which he had had the opportunity to inspect an establishment entirely devoted to the design and construction of marine aircraft.

London to Denmark by Air

THE Instone Air Line announce that negotiations are being completed with Det Danske Luftfartselskab, the managing director of which is Mr. Willy Woolf, for through air bookings from Copenhagen to London via Cologne. It is estimated that the new service, which, it is hoped, will be started in the early spring, will save 18 hrs. on the trip between London and Copenhagen.

Martlesham Heath Re-union Dinner.

THE third annual re-union dinner of the Aeroplane Experimental Establishment, Martlesham Heath, will be held at the Café Royal, Regent Street, on Friday, January 26, 1923, at 7 p.m., when the chair will be taken by Air Vice-Marshal Sir W. G. H. Salmond, K.C.M.G., C.B., D.S.C., R.A.F.

Will any old member of the Station, who intends being present kindly communicate, as early as possible, with Captain F. G. Robinson, "C" Flight, R.A.E., Farnborough, Hants.?

The main characteristics of the LeO H. 13 are as follows: Length, o.a., 11.5 m. (37 ft. 7 ins.); span 16 m. (52 ft. 4 ins.); wing area, 58 sq. m. (623 sq. ft.); weight empty 1,600 kgs. (3,520 lbs.); fuel for 4 hours at full throttle 300 kgs. (660 lbs.); useful load, 550 kgs. (1,210 lbs.); total loaded weight, 2,450 kgs. (5,390 lbs.); wing loading, 42.2 kgs./sq. m. (8.6 lbs./sq. ft.); power loading, 8.2 kgs./h.p. (18 lbs./h.p.); speed at sea level, 160 km. (99 m.p.h.); radius of action about 350 miles.

A similar model, but with retractable undercarriage for amphibian use, is fitted with two 180 h.p. Hispano engines.

The LeO H. 10 is a twin float reconnaissance seaplane with 375 h.p. Lorraine-Dietrich engine. The machine is chiefly remarkable on account of its unusual wing bracing, which is in the form of a Warren girder, thus eliminating the usual wire bracing of the wing cellule. Owing to the fact that the folding wings are hinged to one of the sloping struts which run from the top centre line (there is no centre-section) to the float, the wings take up a curious attitude when folded. As in the case of the LeO 13, the wing section is the Göttingen 430. In order to allow the wings to fold close against the fuselage, the trailing edge of the top plane is hinged, and in the photograph it can be seen folded downwards.

A few characteristics of the LeO H. 10 may be of interest: Length, o.a., 10.45 m. (34 ft. 4 ins.); span, 15 m. (44 ft.); wing area, 59 sq. m. (633 sq. ft.); weight empty, 1,705 kgs. (3,750 lbs.); weight of fuel, 295 kgs. (650 lbs.); useful load, 450 kgs. (990 lbs.); total loaded weight, 2,450 kgs. (5,390 lbs.); wing loading, 8.6 lbs./sq. ft.; power loading, 14.6 lbs./h.p.; estimated speed at 1,000 m. 160 kms. (99 m.p.h.); ceiling, 5,550 ms. (18,300 ft.).

A Fatal Accident at Stanmore

WHILST making a test flight on the 10th inst., a D.H.16, Capt. R. E. Keyes, who was accompanied by four mechanics, had engine failure over Stanmore and crashed into a field. The pilot and one of the mechanics, L. L. Arnell, were killed, and the other three mechanics were taken to Bushey Hospital, suffering from serious injuries. The inquest was opened last Saturday, and was adjourned pending the attendance of one of the injured men.

An Aeroplane Crash in Corsica

AN aeroplane belonging to the Aeronavale Co., carrying mails between Antibes and Corsica, crashed as it was about to land—apparently due to the breaking of an aileron—and the pilot and three English passengers were killed, and the wireless operator seriously injured. The pilot was M. Desnoyelles, and the names of the passengers are Capt. Alexander Macking, Major Jeffreys, and Mrs. Jeffreys, his wife.

An Aerodrome for Blackpool?

THE Manchester Aviation Co. has sent in an application for an aerodrome site to the Blackpool Town Council. An aerodrome in or near this town would undoubtedly be popular, for joy-flips have always been very much in demand at this well-known pleasure resort, but up to now aerodrome facilities have been wanting.

Brussels Air Mail

THE Postmaster-General announces that the dispatch of air mails to Brussels is temporarily suspended. The air mail to Cologne is being maintained.

Gliding for Nearly Two Hours

ON January 15, Bossoutrot, the famous Farman pilot, remained in the air for nearly 2 hrs. (1 hr. 54 mins.) on the Farman "Moustique." Starting from the hills overlooking the village of Camiers near Etaples at 12.50 p.m., he cruised backwards and forwards along the range of hills for the time stated. At times, he got several hundred feet above his starting point, and a long way out from the hills. Finally, he was driven down by the fact that he was insufficiently warmly clothed.

Air Mail Stamps and Correspondence

THE Editor of FLIGHT invites correspondents throughout the world to send him letters (addressed to 36, Great Queen Street, Kingsway, London) by their national or local air mails. These will have special and personal acknowledgment in the Editorial columns of FLIGHT, and help to encourage the more general use of the air for mail carrying. The Editor would also greatly appreciate any items of interest or news relating to air mail services and air stamps.

GLIDING, SOARING AND AIR-SAILING

A SMALL low-power engine, suitable for gliders, is now being produced in France, in addition to the A.B.C. le Rhone, illustrated last week. This engine has been designed by M. Violet, and is to be known as the "Violet-Sicam." Fundamentally the engine is an air-cooled two-stroke two-cylinder opposed of 6-7 h.p. The normal power is represented by the lower figure, and an extra h.p. can be developed during taking-off or in an emergency. It is intended, we understand, to make the new engine in two standard models, one of which will have cast-iron cylinders and the other aluminium alloy cylinders. The former is stated to weigh 9.4 kgs. (21 lbs.), and the latter 7.8 kgs. (17.2 lbs.). These figures include carburettor and magneto, but not propeller.

THE bore and stroke of the engines will be 56 mm. by 50 mm. respectively, giving a total cubic capacity of 250 cu. cm. At the moment, no figures are available relating to the speed at which the engine will normally run, so that it is not possible to express any opinion regarding probable propeller efficiency. The crankshaft is to be made of chrome-nickel steel, and will run on ball bearings. The pistons will be of aluminium alloy, and it is estimated that the average fuel (petrol and oil mixed) consumption will be 3 litres (.66 gal.) per hour.

IN connection with this engine, it may be of interest to quote a few figures from some estimates which M. Louis Clement has got out relating to very low power machines. To begin with, M. Clement states, the experiments with gliding have shown that what we must aim at is so to reduce the weight of the machine itself that the weight of the pilot becomes the main factor in the total loaded weight of the machine. If an engine is fitted, its weight and fuel consumption become also of great importance, hence the need for a low-power light engine.

As an estimate of the manner in which the item weights of a light machine or glider fitted with a small engine might fall, M. Clement makes the following suggestion: Machine 70 kgs. (154 lbs.); pilot, 70 kgs. (154 lbs.); 10 h.p. motor, 16 kgs. (35.2 lbs.); fuel for 3 hrs., 14 kgs. (30.8 lbs.); total loaded weight, 170 kgs. (374 lbs.). This very light weight is, M. Clement says, one to which we have not yet become accustomed, and it leads to some rather extraordinary performances. M. Clement then gives some estimates which, although purely theoretical, he does not think will be greatly different from actual facts. He has made the estimates for machines fitted with engines of 6 h.p. and 10 h.p. respectively, and for machines of 12, 15 and 24 sq. m. area (129 sq. ft., 161.5 sq. ft. and 258 sq. ft. respectively).

FOLLOWING are the results at which M. Clement arrives:—

(a) 6 h.p. engine; total weight, 330 lbs.; wing area, 258 sq. ft.; span, 36 ft. 1 in.; wing loading, 1.28 lbs./sq. ft.; power loading, 55 lbs./h.p.; maximum speed, 39 m.p.h.; landing speed, 21 m.p.h.; ceiling, 13,100 ft.; minimum power required at ground level, 2.86 h.p.

(b) Engine, 6 h.p.; weight, 330 lbs.; area, 129 sq. ft.; span, 21 ft. 4 ins.; wing loading, 2.56 lbs./sq. ft.; power loading, 55 lbs./h.p.; maximum speed, 45 m.p.h.; landing speed, 27 m.p.h.; ceiling, 8,800 ft.; minimum power required near ground, 3.69 h.p.

(c) Engine, 10 h.p.; weight, 363 lbs.; area, 129 sq. ft.;

span, 28 ft.; wing loading, 2.82 lbs./sq. ft.; power loading, 36.3 lbs./h.p.; maximum speed, 56.5 m.p.h.; landing speed, 28.4 m.p.h.; ceiling, 17,400 ft.; minimum power required near ground, 3.97 h.p.

(d) Engine, 10 h.p.; weight, 374 lbs.; area, 161.5 sq. ft.; span, 31 ft. 2 ins.; wing loading, 2.32 lbs./sq. ft.; power loading, 37.4 lbs./h.p.; maximum speed, 54 m.p.h.; landing speed, 25.7 m.p.h.; ceiling, 17,400 ft.; minimum power required near ground, 3.7 h.p.

M. LOUIS CLEMENT then assumes a mean speed of 75 kms. (46.5 miles) per hour, and a mean fuel consumption of 5 litres (about 1½ gals.) per hour, which gives close on 41 m.p.g. This, at a speed of 46 m.p.h., should be sufficiently economical to ensure the popularity of the low-power machine if other features, such as low first cost and maintenance of engine and machine can be attained. The fuel cost alone works out at approximately 1d. per mile or slightly less. This certainly looks promising for the "motor-cycle of the air."

LIEUT. THORET, who recently remained aloft for 7 hrs. 3 mins. on a Hanriot school machine with engine stopped, has now set up a new world's record for gliding with a passenger. On January 9, he succeeded in remaining aloft for 1 hr. 9 mins. accompanied by his mechanic. He could, it is stated, have stayed up longer, only he discovered that the official observers were leaving.

THE first glider school to be established in France is now in course of formation. It will be situated on the slopes of Menez-Hom, near Brest, and the directors will be MM. Bayard de Mendoca and Lestrade. Some time ago, we announced the intention of Capt. Merriam to establish a gliding school in the Isle of Wight.

MANEYROL, winner of the *Daily Mail* gliding competition at Itford, is at present at Vauville near Cherbourg in order to study the suitability of the district. If his report is favourable the site will be definitely chosen for the competition this year. It is understood that Maneayrol has with him the Peyret glider on which he remained aloft for 3 hrs. 21 mins. 7 secs. at Itford. No doubt, he is anxious to beat Thoret's duration record.

WITH reference to a report published in one of the evening papers last week, to the effect that the Air Ministry had received from the Treasury a grant for £1,000 for the establishment of a permanent gliding station at Itford, we are officially informed that no such Treasury sanction has been given. We only wish the rumour had been true, as the establishment of such a station would have done a great deal towards furthering the progress and science of gliding.

IN order to encourage gliding and sailplaning in America, the National Aeronautic Association of U.S.A. have appointed a sub-committee to deal with this form of flying. The chairman of this committee is Orville Wright, who will be assisted by the following members of the committee:—Dr. George Lewis, Executive Secretary of the National Advisory Committee for Aeronautics; Professor E. P. Warner of the Aeronautical Department of the Massachusetts Institute of Technology; E. T. Allen, also of the M.I.T., who took a glider to the French competition at Clermont Ferrand and to Rhön, and B. Russel Shaw, Vice-Chairman of the Contest Committee of the National Aeronautic Association.

The official languages of the Congress will be French and English. An opportunity will also be afforded of visiting various British aircraft establishments and factories. An Official Report of the Congress will be published, which may be subscribed to for £1 additional to Membership Subscription (Member, £1; Associate Member, 10s.).

Mr. J. D. North ill

MR. J. D. NORTH, Chief Engineer and Designer of Boulton and Paul Aviation Department, craves the indulgence of people who have not had replies to their correspondence. Mr. North is, at present, in a nursing home, and will not be able to attend to business for several weeks. We are sure all his many friends will join us in wishing him a speedy recovery.

International Air Congress

FURTHER particulars are to hand in connection with the International Air Congress, which is taking place in London on the invitation of the British Government, from Monday, June 25, to Saturday, June 23, inclusive. The principal object of the Congress is to give an opportunity for international discussion of the various problems in connection with aircraft design, construction and operation. The papers to be read will be divided into four groups: (a) Aerodynamics, Aeroplane Construction, Research Methods, etc.; (b) Power Plants, Fuels, Lubrication, Airscrews, etc.; (c) Air Transport and Navigation; (d) Personnel, Air Tactics and Strategy (as affecting Commercial design), Airship Design and Construction, etc. These groups will hold Sessions simultaneously.

THE JUNKERS ALL-METAL MONOPLANE

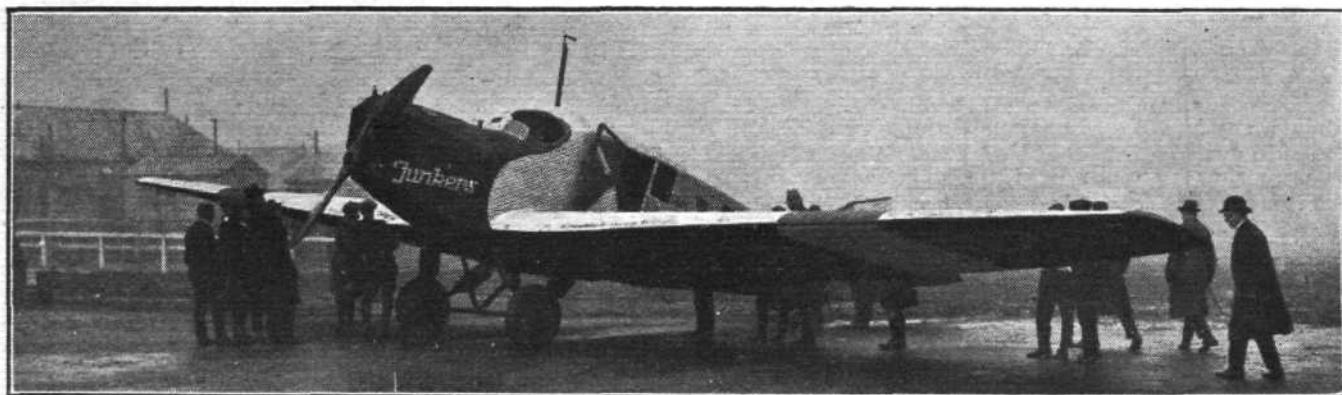
180 H.P. B.M.W. Low-Compression Engine

IN our issue of last week we published a brief *résumé* of the paper on "Metal Aeroplanes" read before the Royal Aeronautical Society by Mr. Stern on behalf of Professor Junkers, who was prevented by illness from being present. At the conclusion of the lecture it was announced that permission had been obtained for one of the Junkers machines to fly to this country in order to give members of the R.Ae. Soc. an opportunity of examining Professor Junkers' method of metal construction.

The machine arrived on Thursday of last week (January 11), and by permission of the Junkers representatives (and greatly assisted by Mr. Stern, of the Air Ministry Laboratory, South Kensington, who acted as interpreter), our representatives were allowed to examine the machine in detail for the purpose

purposes. We have always understood that the experience with these machines was not a very happy one, but we were informed by the Junkers representatives that the original makers had nothing to do with the machines after they left the Dessau works, and that alterations were made to them, so that the Junkers firm feel that they should not be blamed for anything that went wrong. They stated that of the machines used in Germany, under the supervision of the original makers, not a single one gave any trouble.

Fundamentally the Junkers monoplane is a cantilever wing machine, with the wing placed low on the fuselage ("tiefdecker" is the German name) in the place usually occupied by the lower plane of a biplane. The reasons for this arrangement were outlined in Professor Junkers' paper,



THE JUNKERS MONOPLANE: Three-quarter front view.

of compiling the following notes, and in order to obtain the accompanying sketches and photographs.

The particular machine which visited Croydon was one taken from the regular service. So far as could be ascertained it was built in 1921, but had not been in constant use all the time since, having, apparently, spent some of the time as one of many "confiscated" by the Inter-Allied Commission. Certainly the metal showed no signs whatever of corrosion externally, but as the length of time during which the machine has been in actual service is not known, this fact does not really enable one to form an opinion. We were informed by the pilot that one of these machines which had been in service in Sweden for over a year had been left out in the open habitually, had been in the sea (it was a seaplane), and generally had been very far from receiving careful treatment, yet the metal nowhere appeared to have suffered from corrosion, in spite of the fact that it was built of Duralumin throughout. The exact treatment of the metal is not known, but it appears that some form of aluminium paint is coated on all the parts before they are assembled, and the whole structure then given one or two coats of varnish.

In type the Junkers monoplane which visited Croydon is not new, a considerable number having been in use in Germany, while others were purchased for America by Mr. John Larsen, and were used in that country for various

the wing roots, fuselage, etc., forming one solid unit to which all the heavy loads and the wings themselves are attached. Aerodynamically this arrangement has been found to be slightly inferior to the more usual arrangement in which the wing is placed above or on the top of the fuselage, but Professor Junkers considers that the slight loss is more than made up for by the rigid structure resulting from the low position.

During the War a few all-metal Junkers machines were captured, and one or two were, at one time, on view at the exhibition of enemy aircraft at the Agricultural Hall, Islington. The armoured biplane was briefly described and illustrated in *FLIGHT* of November 28, 1918. The monoplane, the Junkers D.1, was described and illustrated in our issues of April 1 and April 8, 1920, while a commercial machine, very similar to the present specimen, was illustrated in *FLIGHT* of October 30, 1919. The latter machine was the one which reached an altitude of 6,750 metres with eight people on board, as mentioned in Professor Junkers' lecture. The engine used on that occasion was one of the 185 h.p. B.M.W. over-dimensioned, high-compression engines, which maintain their power up to a height of about 15,000 ft. The machine at present under review is fitted with one of the low-compression B.M.W. engines, as the high-compression type was not permitted by the Inter-Allied Commission.



THE JUNKERS MONOPLANE: Three-quarter rear view.



THE JUNKERS MONOPLANE : Side view.

The Cantilever Wing

Although the Junkers monoplane will not be a novelty to readers of *FLIGHT*, it is thought that a few notes dealing with the construction may not be without interest, as it was possible, on our visit to Croydon, to ascertain certain constructional features which were not published in previous articles. The cantilever wings are characterised by the same

Thus the whole wing structure is perfectly triangulated, except for the bays in the plane of the covering. These are not braced by strips, the corrugated covering being evidently relied upon for this purpose as well as for covering.

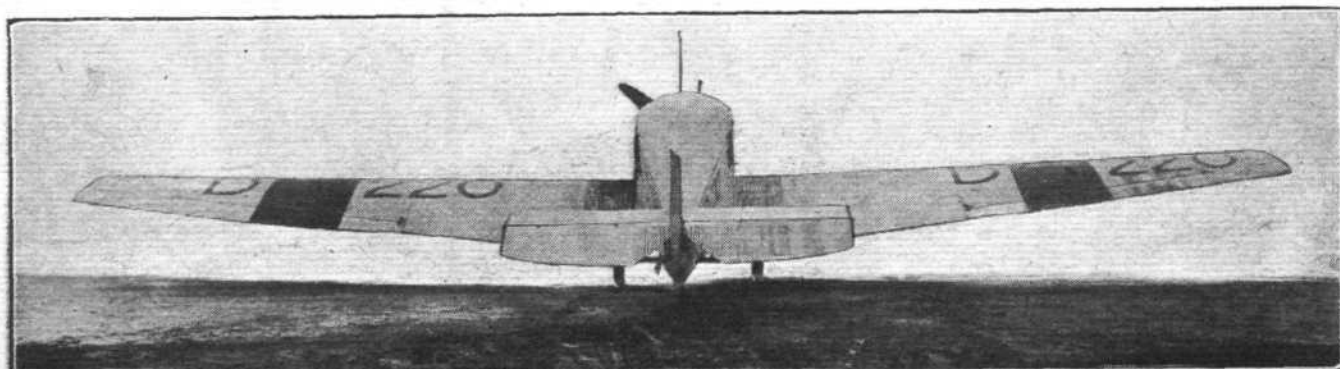
In the wing roots, built as integral parts of the fuselage and extending about three feet out from the body, the diagonal members are of the same tubular form as the spars themselves,



THE JUNKERS MONOPLANE : On the left, view of the engine housing and undercarriage. On the right a view of the tail.

construction as that employed in the D.1 fighter, *i.e.*, a number of tubular Duralumin spars tied together by corrugated strips triangulating the structure. The upper and lower spars are staggered in relation to one another, *i.e.*, the tube near the upper surface is placed over the space between two consecutive lower tubes. The diagonal ties then run from lower to upper tubes and *vice versa*, sloping outwards at the same time.

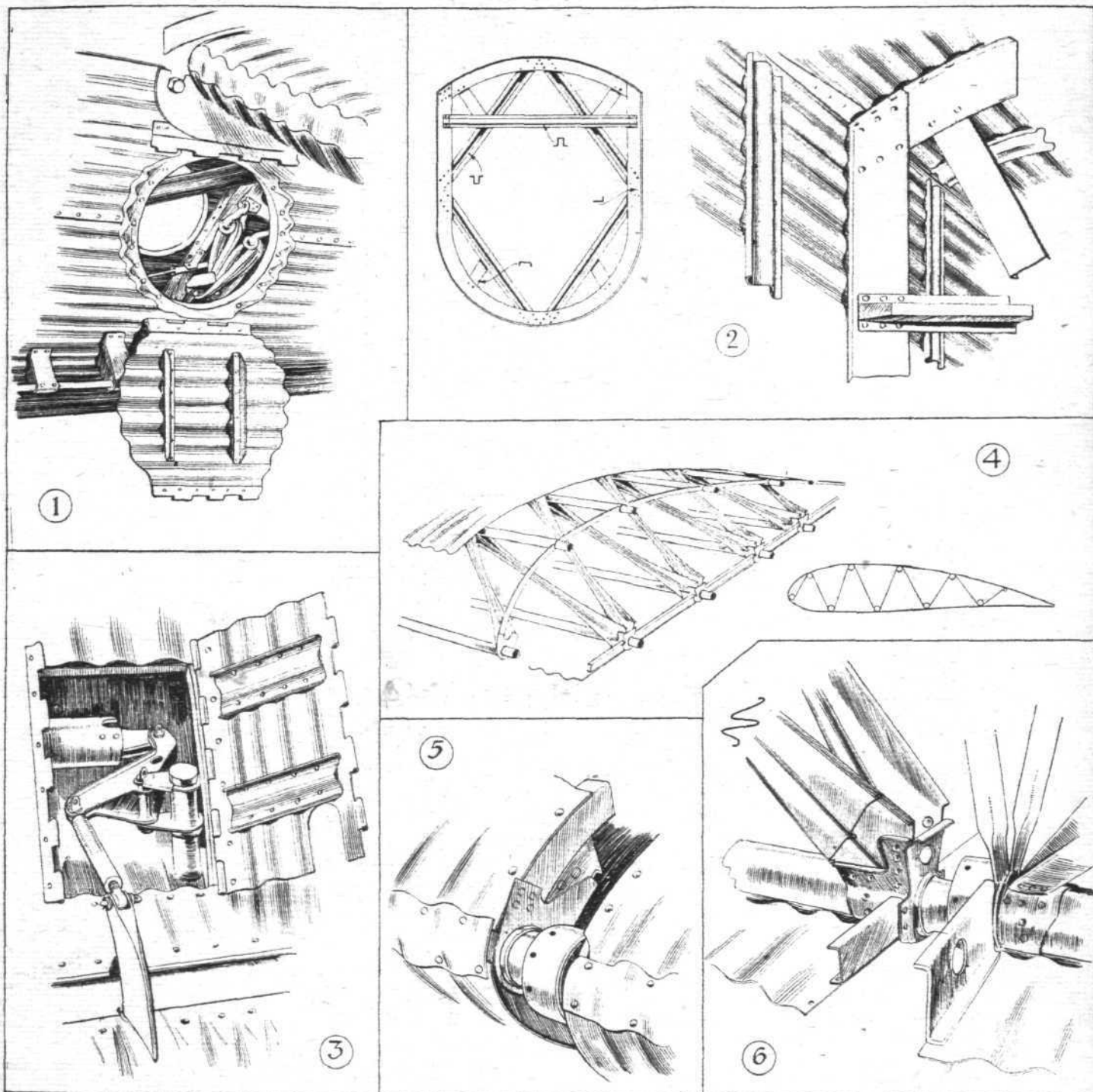
whereas in the wing end pieces the bracing is by corrugated strips. These strips are spread out towards their ends, where they are flattened out to lie against the curve of the tubular spars, to which they are riveted. In this connection it is of interest to mention that the manner of "holding-up" when riveting is done by a special tool designed for this purpose, and we believe, patented by Junkers. At the lecture a slide



THE JUNKERS MONOPLANE : Rear view. This illustration gives a good idea of the large span of the machine.

was shown of the manner in which this tool works. The tool is essentially a long rod, carrying an excentric. This rod is pushed into the tube until the excentric is opposite the hole into which the rivet is being put. The rivet is inserted and the rod turned until the excentric bears on the end of the rivet. One man then taps the rivet head while another slowly turns the rod so as to keep the excentric always in contact with the rivet. In this manner the riveting proceeds fairly rapidly,

The manner of attaching the wing end pieces to the wing roots has already been described both in our article on the armoured biplane and also in that dealing with the D.1 single-seater fighter. It is in the form of pipe unions in each tubular spar, steel liners being inserted in the end of the tubes to strengthen the joint. A special spanner is used for tightening up the joints, and it is stated that the operation of detaching or attaching a wing is very quickly carried out.



THE Junkers Monoplane : Some sketches of constructional details. 1 shows the inspection door in the side of the fuselage which gives access to the tail skid. The large tube runs to the elevator crank. The trimming tank is just in front of the door, inside the body. 2, details of the fuselage construction. No longerons are used, the corrugations of the covering taking the place of separate longitudinal members. 3 shows the aileron tube-and-crank control which takes the place of cables. 4 is a general view of the wing construction. The small inset is a diagram of the wing section, showing approximate location of spars and bracing strips. 5, the union joint in the front spar. 6, a typical joint between wing root spars and the spars of the end pieces. In the wing roots the bracing members are tubular, whereas in the end pieces the spars only are tubular, the bracing members being made from strip metal, crinkled as indicated in the two sections.

and it is stated that with a little practice the workmen can make perfect riveted joints.

In the actual construction of the wings the internal structure is built up on one set of jigs while the sheet covering is bent to shape on another. The framework is then slipped into the covering, and the latter riveted to the tubular spars on top and bottom, using, presumably, the same tool for "holding-up." We were informed that in the monoplane which visited Croydon something like 85,000 rivets are used.

Owing to the fact that there is a change in the direction of the spars at the point of the junction of end pieces to wing roots, the unions have a slight cup shape, forming in fact a sort of ball-and-socket joint. The gap between wing root and wing is covered afterwards by a Duralumin strip folded over the trailing edge and secured on the leading edge by wing nuts. This strip has internally hooks formed of sheet aluminium which slide over the spars as the strip is being pulled into place. The wing section appears to be bi-convex, with

a distinct "wash-out" or decrease in the angle of incidence towards the tip.

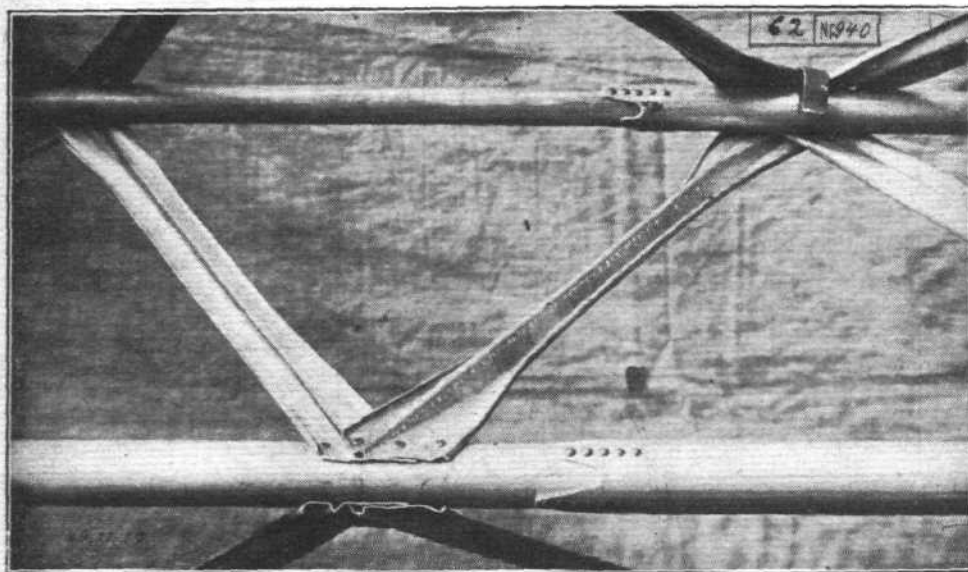
The Fuselage.

The fuselage of the Junkers is mainly of interest, apart from its somewhat unusual shape, on account of the all-metal construction, in which no longitudinal members are used, the corrugated Duralumin covering serving the purpose of long-erons. Fundamentally the fuselage is built up of formers mainly constructed of channel sections, to which the sheet

appears to us doubtful whether the risk of having a petrol pipe running down the whole length of the fuselage, and liable to break in case of a crash, is an arrangement that should be advocated.

Controls

The control column itself is of orthodox type, but an unusual feature is that both ailerons and elevators are controlled *via* large diameter tubes, working both in tension and compression. Those to the ailerons run to crank levers, as shown



□ □ □ □ □ □ □ □ □ □

The Junkers Monoplane:
This photograph, a slide of which was shown at Professor Junkers' lecture, illustrates the wing construction. Note how bracing strips are merely riveted to sides of tube.

covering is riveted. One of the accompanying sketches shows the details of the construction. The fuselage has flat sides, but curved top and deeply curved bottom. In front the top covering sweeps down to the cockpits for pilot and engineer, which are of the open type and placed side by side, immediately aft of the engine.

The cabin itself has accommodation for four passengers. A "sofa" seat runs right across the rear wall of the cabin, while the two front seats are separate and are so hinged that they can be tilted forward in order to facilitate entrance to or exit from the cabin. Behind the rear seat is a compartment for luggage. There is a door in each side, but apparently that on the starboard side is intended chiefly as an emergency exit, as there are no steps on the wing root on that side. Windows in both sides admit light, and as there is no wing above the cabin to obscure the light, the cabin appears to be quite well lighted. The view downward is obstructed to a considerable extent by the large-chord wing placed low on the fuselage.

The Engine

The 180 h.p. low-compression B.M.W. engine is placed on metal bearers in the nose of the fuselage. In front of it is a car-type radiator, with shutters for varying the cooling. The engine is covered by a bonnet which hinges along its rear end so that when it is raised and leaning back against the "hump" of the fuselage the engine is quite exposed. A number of catches secure the cowl in place, so that the possibility of it blowing back during flight should be very remote. The petrol tanks are placed one in each wing root. Owing to the internal bracing the shape of the tanks is rather complicated. A small gravity tank is placed in the pilot's cockpit. It is of interest to note that no water tank is fitted, the amount carried in the water jackets and radiator being sufficient. The capacity of the two main petrol tanks is about 320 litres (70 gallons), which is sufficient for approximately 8 hours' flight at 1,200 r.p.m., corresponding to a cruising speed of about 140 km. (87 miles) per hour. The two tanks are connected by a tube of very small diameter, so that, although petrol will flow from one tank to the other, it does so very slowly, and there is no danger of one tank becoming empty while the other is full, which might upset the lateral stability.

The arrangement for trimming is unusual. In place of a trimming tail plane, such as is found on the majority of British aeroplanes, a small petrol tank, with a capacity of just under two gallons, is placed in the fuselage near the tail skid. Normally this tank is empty, but when the machine is flown without passengers, or with only one or two passengers, petrol is pumped, by a hand pump in the pilot's cockpit, into the trimming tank until the machine is in the right trim. Although simpler, mechanically, than a tail plane trimming gear, it

in one of our sketches, while that to the elevator runs first to a crank on a lay shaft some distance back in the fuselage, another running from there to the elevator crank. The latter tube can be seen in the sketch showing the inspection doors near the tail skid. An interesting feature of the aileron control is that the single aileron crank is placed at the extreme inner end of the aileron, so that the torsion on the aileron leading edge must be considerable. The corrugated covering however, makes the ailerons extremely stiff, and when the aileron was held in place and a lift applied at the outer end it was scarcely possible for a man to twist it to any perceptible extent. The rudder controls are by foot bar and cables in the ordinary way.

Undercarriage

The undercarriage of the Junkers monoplane is of the Vee type, but is remarkable for the fact that both front and rear struts are sprung. The shock absorbers are in the form of steel springs, enclosed in streamline casings. One wheel can rise without the other if the movement is a vertical one, but it appears that if one wheel is knocked back by a bump, the opposite one has to move forward. A lateral Vee carries at its apex the hinges for the axles, which move separately in a vertical plane, but together in a horizontal plane. The lateral Vee serves to locate the entire chassis in a lateral sense, but is hinged to the fuselage to allow a slight forward and aft movement. As the machine did not fly on the day of our visit to Croydon, owing to the fog, we were not able to see how the undercarriage behaves in taxiing and landing, but we were informed that it is entirely satisfactory. A tail skid sprung and swivelled in the usual way protects the tail planes against contact with the ground.

But few particulars of the Junkers monoplane are available, but following are a few which are thought to be approximately correct:—Span, 17·1 metres (56 ft. 1 in.); wing area, approximately 350 sq. ft.; weight of machine empty, but with cooling water, 1,155 kg. (2,540 lb.); useful load, 645 kg. (1,200 lb.); maximum permissible total weight, 1,800 kg. (3,635 lb.); power loading (180 h.p.) 20·2 lbs./h.p.; wing loading 10·7 lb./sq. ft.; maximum speed, about 160 km. (100 miles) per hour; cruising speed, 140 km. (87 m.p.h.); landing speed, 80 km. (50 m.p.h.); duration, 8 hours at cruising speed, corresponding to a range of about 700 miles.

Herr Patze, one of the directors of the Junkers air lines, visited this country in order to try to arrange with the Daimler and Instone lines for an extension of their services into Germany. Junkers machines picking up the passengers and goods at Amsterdam and Cologne. Owing to the French occupation of the Ruhr the arrangements have had to be postponed, but it is to be hoped that later on the suggested connection will come into being.

AVIATION IN SWEDEN

THAT considerable progress is being made in aviation in Sweden was demonstrated by the success with which a cross-country handicap contest was carried out a little while back. This contest was arranged for military pilots only, and was flown over a circuit starting and finishing at Malmslätt, with controls at Stockholm and Orebro, where compulsory stops of 1 hr. had to be made for re-fueling, etc. Altogether, there were 18 entries, and out of the 17 starters, only 6 failed to complete the course.

Perhaps the most interesting feature of this contest was the method of handicapping the machines. Earlier in the day of the race, every machine was given a trial flight under fixed and identical conditions, and from the speed obtained, the handicap was worked out for the course, making due allowance for the strength and direction of the wind.

appeared over the tree-tops, and by a skilful bit of piloting, crossed the line 5 secs. in front of his comrade.

This contest and others held during last year have shown that there exists a great interest in aviation, not only amongst civilians, but in the army and navy. It is hoped to hold many further flying contests in Sweden during the present year.

In connection with the Gothenburg Aero Exhibition, which is being held during July and August this year, it may be of interest to state that one of the features of the Exhibition will be a section, arranged in collaboration with the Swedish postal establishment, devoted to postal and commercial aviation, and housed in a large pavilion especially built for the purpose. It is intended to get former as well as present airway systems represented, and a section will be apportioned



Aviation in Sweden: Some single-seater fighters lined up for a cross-country handicap contest, between Malmslätt-Stockholm-Orebro-Malmslätt, held last year for Swedish military pilots.

Furthermore, these trial flights were carried out by pilots not flying in the race.

The machines employed were all military ones, of a variety of types, from the small 90 h.p. Training-Fighter 'bus to the 265 h.p. Scout—of which some single-seater fighters are shown, lined up before the start of the race at Malmslätt, in the accompanying illustration.

That the handicapping was efficiently carried out may be judged by the fact that at the finish, the machines came in very close together—in fact, there was an exciting fight between the two foremost machines for first place, when one, piloted by Lieut. Kjellberg, who was the first to be observed making for the finishing line, was beaten at the last moment by Lieut. Montgomery, who, flying very low, suddenly

to each country where civil air services have been, are or will be employed. It is thus hoped to demonstrate the important rôle aviation plays in modern transport and communication throughout the world. The following countries will probably be represented:—Great Britain, France, Germany, U.S.A., Canada, Mexico, Argentine, Brazil, Uruguay, China, Australia, New Zealand, Siam, Congo, etc. This section will include photographs illustrating the progress, etc., of air transport, statistics regarding the regularity and safety of existing air services, and a complete collection of air mail stamps. It will, in fact, be made as complete and comprehensive as possible, and many of the exhibits will certainly be of great value and very unique. Further particulars may be obtained from Admiral Mark Kerr, 16, Cumberland Terrace, Regent's Park.

THE LONDON-CONTINENTAL SERVICES

FLIGHTS BETWEEN DECEMBER 31, 1922, AND JANUARY 13, 1923, INCLUSIVE

Route (including certain diverted journeys)	No. of flights*	No. of passengers	No. of flights carrying		No. of journeys completed†	Average flying time	Fastest time made by	Type and (in brackets) Number of each type flying
			Mails	Goods				
Croydon-Paris ...	22‡	49	9	20	20	h. m. 2 27	H.P.W.8BG-EBBI (2h. 0m.)	B. (1), D.H. 9 (1), G. (9), H.P.W.8B. (3).
Paris-Croydon ...	21§	75	9	18	13	3 14	H.P.W8B G-EBBG (2h.23m.)	B. (2), G. (8), H.P.W.8B. (3).
Croydon-Brussels-Cologne	8	13	6	—	7	3 17	D.H. 4 G-EAMU (2h. 46m.)	D.H. 4 (1), D.H. 18 (1), D.H. 34 (3).
Cologne-Brussels-Croydon	10¶	16	9	—	8	4 34	D.H. 4 G-EAMU (3h. 41m.)	D.H. 4 (1), D.H. 18 (1), D.H. 34 (3).
Croydon-Rotterdam ...	5	5	5	5	5	2 9	Fokker H-NABN (1h. 43m.)	F. (4).
Rotterdam-Croydon ...	7	8	7	7	6	2 53	Fokker H-NABI (2h. 49m.)	F. (4).
Manchester-Croydon-Amsterdam	10**	23	1	1	10	4 44	—	D.H. 9 (1), D.H. 34 (3).
Amsterdam-Croydon-Manchester	14††	14	5	2	14	—	—	D.H. 9 (1), D.H. 34 (4).
Total for two weeks ...	97	203	51	53	83			

* Not including "private" flights.

† Including certain journeys when stops were made *en route*.

‡ Lym.-L.B. 8.

§ L.B.-Lym. 5.

|| Ost.-Col. 2.

¶ Col.-Ost. 2.

** Man.-Croy. 6, Croy-A'dam. 1.

†† A'dam.-Croy. 5, Croy.-Man. 9.

Av = Avro. B. = Breguet. Br. = Bristo. Bt. = B.A.T. D.H.4. = De Havilland 4, D.H.9. (etc.). F. = Fokker. Fa. = Farman F.50. G. = Goliath Farman. H.P. = Handley Page. M. = Martinsyde. Sp. = Spad. Vi. = Vickers Vimy. Vu. = Vickers Vulcan. W. = Westland.

The following is a list of firms running services between London and Paris, Brussels, etc., etc.:—Co. des Grander Expresses Aériennes; Daimler Hire, Ltd.; Handley Page Transport, Ltd.; Instone Air Line; Kononklijke Luchtvaart Maatschappij; Messageries Aériennes.

Incidental Flying.—Messrs. Perry and Piercey, and Capt. Stocken testing D.H. 9's for the Aircraft Disposal Co. at Croydon, Mr. Piercey flying two to Ireland on the 6th and 11th respectively.

LONDON TERMINAL AERODROME

Monday evening, January 15, 1923.

FOG caused a total cessation of air traffic on Saturday and Sunday, but for the rest of the week the services were run with quite good regularity. There is, however, quite a big falling-off in passengers, and, as some of the British air lines are well up to their subsidy mileage, they are taking the opportunity of cancelling such services as there are not passengers for, and saving the mileage for the summer, when it is expected that there will be full loads all the time.

The Aircraft Disposal Company is busy on orders for most parts of the civilised world, and its pilots are having a busy time. Mr. Piercy has been delivering D.H.9's, Bristol "Fighters," Martinsydes, and an odd S.E.5 to Baldonnell aerodrome, near Dublin, for the Irish Free State. Yesterday he was testing a new D.H.9a, which has a Rolls-Royce engine and Lamblin radiators. This machine is equipped with five machine-guns, two firing ahead from the pilot's seat, and two firing from the top of the fuselage from the back, with an additional one firing through a tunnel down below the machine. This machine is intended for demonstration, and I understand that Mr. Piercy is taking it out to Spain.

The Junkers Monoplane at Croydon

THE Junkers all-metal monoplane, which was expected at the aerodrome in connection with Professor Junkers' lecture to the Royal Aeronautical Society, arrived during the week, having flown from Gelselkirchen to Lympne, and thence to Croydon. The day the machine arrived the Secretary of State for Air, Sir Samuel Hoare, accompanied by Lady Hoare, was visiting the aerodrome, and took the opportunity of making a close inspection of the German machine. During the week various members of the Royal Aeronautical Society, and some of the staff of the Research Department of the Air Ministry, visited the aerodrome in order to inspect the Junkers.

Now that the amalgamation of the C.M.A. Air Lines and the Grands Express is an accomplished fact, M. Didier, who has been in charge of the C.M.A. Air Lines at the aerodrome, returned to France today, where he will, I understand, occupy a similar position at Le Bourget. M. Boudier, who has been controlling the destinies of the Grand Express at Croydon, will remain in charge for the new combination.

The Instone Air Line have been running their D.H.4a on the London-Ostend-Cologne service during the week, in addition to the D.H.34's and 18's. They now call at Ostend, for Customs and petrol in Belgium, instead of at Tirlemont.

Record "Air Express" Flights

ON one day during the week they made a record trip to Cologne with a D.H.34, the total flying time for the whole distance being only 2 hours 31 minutes. The same day the Daimler "air express," flying from Manchester to Amsterdam via London, broke the record for this trip. There was one through passenger, and he left Manchester at five minutes to ten, and, after having lunch in the Trust House at Croydon, was in Amsterdam at eight minutes past two. The actual flying time for this trip was only 3½ hours. There was a very strong wind that day, which was entirely in favour of the machines flying to the continent. In fact the machine from Amsterdam to Croydon, flying against the wind, was over seven hours—including stops to refill with petrol—in making the journey.

The New Dainler 34, G-EBCX, was put on the service on Friday, flying from London to Manchester, and returning to Croydon on Monday with the wind behind it in 75 minutes. I understand that Colonel Searle, the managing director of the Daimler Airway, is sailing for America on Saturday, and intends while in America to lecture on air transport. There is probably no one more qualified for this, as, although there are people who have been longer in air transport, there is no one who has applied business methods to this new mode of travel with such success as has Colonel Searle.

The Surrey Flying Services are busily engaged on building new machines for their next season's programme, which is, I am told, to be on a big scale. They will probably have several machines touring the country, and holding joy-ride weeks in the provinces, while at Croydon they intend to extend the scope of their air-taxi work, in addition, of course, to the usual joy-riding.

The Junkers monoplane should have flown back to Germany this morning, but has not yet departed. The pilot intends to attempt a non-stop flight to Berlin, having about seven hours' petrol aboard. It is doubtful, however, if this will be sufficient, having regard to the low speed of the machine.

Today the Handley Page "torpedoplane," with the Napier "Lion" engine, returning from the Continent, gave us a wonderful exhibition of slow-flying. Approaching the aerodrome against a wind of about 30 miles an hour, the pilot opened his slots, throttled down his engine, and descended very slowly, and with hardly any forward movement at all. Then, when about 10 feet high, he opened his motor out, and, climbing almost vertically, headed off for Cricklewood.

PERSONALS

Married.

GEOFFREY FORREST HUGHES, M.C., A.F.C., only surviving son of Sir Thomas and Lady Hughes, was married on January 8, at St. Eunice Church, Sydney, to MARGARET EYRE SEALY, younger daughter of Rev. G. S. S. and Mrs. VIDAL.

To be Married.

The marriage of Mr. ARCHIBALD BUCHANAN YUILLE (late East Lancs. Regt. and R.F.C.), D.F.C., elder son of Mr. and Mrs. HERBERT BUCHANAN YUILLE, of Harescombe, Northwood, Middlesex, to Miss CECILIA FRANCES SILVERWOOD COPE, daughter of Mr. and Mrs. William Silverwood Cope, of

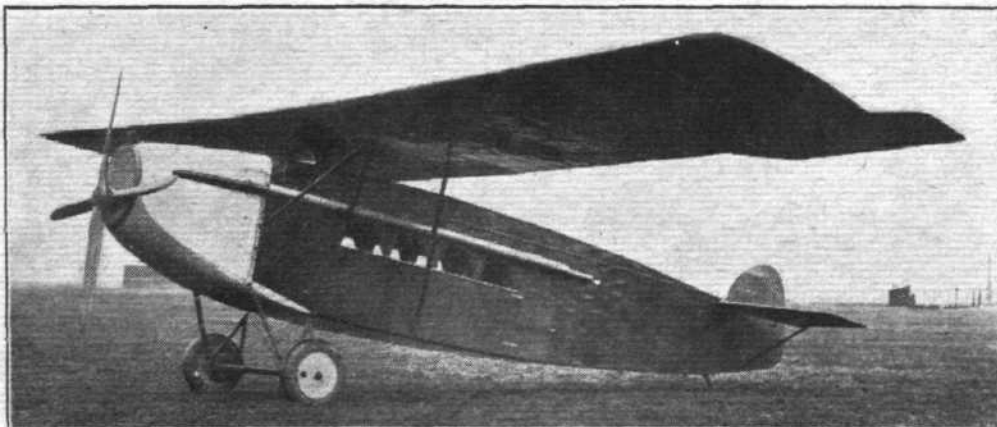
24, Collingham Gardens, S.W. 5, will take place at Holy Trinity Church, Brompton, today, at 2.30 p.m.

An engagement is announced between Flight-Lieut. A. C. SANDERSON, D.F.C., R.A.F., only surviving son of Mr. A. Sanderson, Kingshall Road, Beckenham, Kent, and HAZEL, younger daughter of Captain and Mrs. BERNARD DALY, Templeogue House, Co. Dublin.

Item.

Lieut. Aviateur CHEVALIER WILLY COPPENS, Air Attaché to the Belgian Embassy, who has been on a special mission to Baghdad, returned to London on January 11.

The Fokker F.V. commercial aeroplane (350 h.p. Rolls-Royce): This machine, previously illustrated in FLIGHT as a biplane, is shown here as a monoplane, to which form it may be converted from the biplane in about 15 mins. As a mono. it has a total weight of 3,904 lbs., an area of 484 sq. ft., and a speed of 118 m.p.h.



THE ROYAL AIR FORCE

London Gazette, January 9, 1923

General Duties Branch

Flying Offr. F. R. Wynne is granted perm. commn. in rank stated; Dec. 12, 1919 (since promoted). *Gazette*, Dec. 12, 1919, apptg. him to short service commn. is cancelled. Flight Lieut. S. E. Mailer, A.F.C., is transferred to Res., Class A; Jan. 3. Flying Offr. H. P. Maltby (Lieut., R.G.A.), relinquishes his temp. commn. on return to Army duty; Jan. 1. Wing Comdr. C. E. Risk, D.S.O., is placed on retired list; Dec. 7, 1922. Flying Offr. N. S. Dougall, D.F.C., is placed on retired list on acct. of ill-health contracted on active service. Pilot Offr. C. M. O. Springfield is placed on retired list on acct. of ill-health; Jan. 10.

Reserve of Air Force Officers

Flight Lieut. J. C. Atkinson is transferred from Class B to Class C; Jan. 9. Flying Offr. M. H. McErlean is transferred from Class A to Class C; Dec. 28, 1922. Flight Lieut. J. E. M. Atherley relinquishes his commn. on re-appt. to Manch. R.; Oct. 25, 1922.

Nursing Service.

The following are promoted to ranks stated (Jan. 1):—
Sisters to be Senior Sisters.—Miss M. B. Botwood, Miss M. W. Campbell.
Staff Nurses to be Sisters.—Miss R. Cassidy, Miss M. E. Edwards, Miss G. P. Faulkner, Miss D. France, Miss J. D. Jackson, Miss M. Lamont,

Miss M. C. Messer, Miss D. H. Rich, Miss C. Walker, Miss G. E. M. Clubb, Miss L. E. Taylor, Miss E. M. Clements, Miss M. S. F. Stewart, Miss J. McLeod, Miss M. McGlynn, Miss M. J. MacDonald.

London Gazette, January 12, 1923

General Duties Branch

Lieut. R. H. Portal, D.S.C., R.N., is granted a temp. commn. as Flight Lieut. on attachment for three years' duty with R.A.F.; Jan. 8.

The follg. Pilot Offrs. on probn. are confirmed in rank:—R. Collins, B. R. C. Coope, C. Denison, F. W. M. Downer, M. C. W. C. Flint, M.C., D. McG. Morphy, L. G. Pinnell, G. F. Reeves, A. C. W. Richards, A. Thomson, M. B. F. Watson; Dec. 10, 1922.

Wing Comdr. F. E. T. Hewlett, D.S.O., O.B.E., is restored to full pay from half-pay; Jan. 10. Sqdn. Ldr. R. H. Jones, O.B.E., is placed on half-pay, scale B; Jan. 3. Flying Offr. J. MacG. Fairweather, D.F.C., is placed on half-pay, scale B, for two months, with effect from Jan. 14 inclusive.

Stores Branch

Flight Lieut. W. R. Fairbairn to take rank and prec. as though his appt. as Flight Lieut. bore date July 1, 1922, immediately following Flight Lieut. F. N. Trinder (reduction to take effect from Nov. 22, 1922). Flight Lieut. R. D. Ward-James is removed from R.A.F. on conviction by the Civil Power; Nov. 17, 1922.

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified:—

Group Captain: L. F. Blandy, D.S.O. (R.E.), to Air Ministry (Dept. of C.A.S.). On appointment to Temporary Commission in Royal Air Force as Group Captain, on being seconded from the Army for three years. 30.11.22.

Wing Commander: E. L. Gossage, D.S.O., M.C., from School of Army Co-operation (Inland Area) to R.A.F. Depot (Inland Area) (Supernumerary). 21.1.23.

Squadron Leaders: J. C. Quinell, D.F.C., from School of Naval Co-operation and Aerial Navigation (Coastal Area) to R.A.F. Base, Gosport (Coastal Area) (Supernumerary). 15.1.23. J. Rothwell, M.B., from R.A.F. Depot (Inland Area) to School of Technical Training (Men) (Inland Area). 15.1.23. The 2nd entry of the notification which appeared in R.A.F. Bulletin No. 94 dated 20.12.22, and the notification which appeared in R.A.F. Bulletin No. 97, dated 1.1.23, wherein this Officer was posted from R.A.F. Depot to R.A.F. Hospital, Cranwell, and to School of Technical Training (Men), respectively, with effect from 5.1.23, are hereby cancelled.

Flight Lieutenants: F. J. Murphy, M.B., from No 1 Squadron (Iraq Command) to Headquarters, R.A.F. Middle East (Supernumerary). 6.11.22. F. J. Murphy, M.B., from Headquarters, R.A.F. Middle East to Engine Repair Depot (Middle East). 4.12.22. T. J. X. Canton, M.B., from No. 55 Squadron (Iraq Command) to Headquarters, R.A.F. Middle East (Supernumerary). 6.11.22. T. J. X. Canton, M.B., from Headquarters, R.A.F. Middle East to No. 216 Squadron (Middle East). 4.12.22. J. C. Slessor, M.C. from No. 20 Squadron (India) to R.A.F. Depot (Inland Area) (Supernumerary). 2.12.22. P. J. Murphy, from Stores Depot, Egypt (Middle East) to Aircraft Park (Constantinople Wing). 25.9.22. Substituted for the notification which appeared in R.A.F. Bulletin No. 84, dated 1.11.22, wherein this Officer was posted from Stores Depot, Egypt, to No. 208 Squadron, with effect from 26.9.22. H. Cooch, from Air Ministry (Dept. of A.M.S.R.) to Royal Aircraft Establishment. 1.1.23. A. C. Sanderson, D.F.C., from No. 100 Squadron (Inland Area) to No. 2 Flying Training School (Inland Area). For duty as

Adjutant. 15.12.22. W. H. L. O'Neill, M.C., from No. 2 Flying Training School (Inland Area) to No. 100 Squadron (Inland Area). 8.12.22. Substituted for the notification which appeared in R.A.F. Bulletin No. 93, dated 12.12.22, wherein this Officer was posted as stated above, with effect from 11.12.22. T. Q. Studd, D.F.C., from School of Naval Co-operation and Aerial Navigation (Coastal Area) to No. 2 Flying Training School (Inland Area). 15.1.23. J. A. Perdrau, M.D., from School of Technical Training (Men) (Inland Area) to R.A.F. Depot (Inland Area). 18.1.23. Substituted for the notifications which appeared in R.A.F. Bulletins Nos. 94 and 97, dated 20.12.22 and 1.1.23 respectively, wherein this Officer was posted as stated above, with effect from 12.1.23 and 9.1.23, respectively. L. Smith, from No. 25 Squadron (Constantinople Wing) to R.A.F. Depot (Inland Area) (Supernumerary). 20.12.22.

Wing Commander: C. T. Maclean, D.S.O.M.C., from Headquarters, R.A.F. India to Half-pay List. 19.1.23.

Squadron Leaders: V. Gaskell-Blackburn, D.S.C., A.F.C., from No. 55 Squadron (Iraq Command) to R.A.F. Trans-Jordan Headquarters (Palestine Command). For duty as Station Commandant. 9.12.22. N. H. Bottomley, A.F.C., from Headquarters, R.A.F. Middle East to No. 4 Flying Training School (Middle East). 19.12.22. D. G. Donald, D.F.C., A.F.C. The notification concerning this Officer which appeared in R.A.F. Bulletin No. 97, dated 1.1.23, is hereby cancelled. D. G. Donald, D.F.C., A.F.C., from R.A.F. Base, Gosport (No. 3 Squadron) (Coastal Area) to Air Ministry (Dept. of C.A.S.) (D.T. and S.D.). 22.1.23. H. J. Down, from Headquarters, Constantinople Wing, to Headquarters, Coastal Area (Supernumerary). For duty at Air Ministry as Inspector of Accounts. 19.12.22. H. A. Hewat, M.B., from R.A.F. Depot (Inland Area) to Central Medical Board (Coastal Area). 16.1.23. A. E. Panter, B.A., from Headquarters, Iraq Command, to Baghdad Combined Hospital (Iraq Command). 5.11.22. D. Power, M.C., from No 1 Squadron (Iraq Command) to Baghdad Combined Hospital (Iraq Command). 6.11.22. R. E. Bell, M.B., from Headquarters, Iraq Command to Station Commandant (Iraq Command). 6.11.22.

R.A.F. SHORT SERVICE COMMISSIONS

Openings for Retired Officers of Other Services

THE Air Ministry announces that the Air Council have decided to offer a certain number of short service commissions in the General Duties Branch of the Royal Air Force to officers of the Royal Navy, Royal Marines and Army retired under the special retirement schemes as being surplus to the requirements of those services. The Council hope that by this means officers whose careers in a fighting service would otherwise be terminated may be enabled to continue for a further period in the service of the State.

The following is a general outline of the conditions:—

The officers who are eligible for such commissions are executive officers of the Royal Navy and officers of the Royal Marines retired under the terms of Admiralty Fleet Order No. 1358 of May 12, 1922, and officers of combatant branches of the British Army retired under the terms of Army Order 179 of 1922. They must not exceed the age of 26 at the time of entry into the Royal Air Force and must be physically fit for full flying duties.

Employment will be for seven years on the active list, on the completion of which officers will be under no obligation of reserve service in the Royal Air Force. The Admiralty and War Office have agreed to suspend the liability of these officers to recall to their parent service during an emergency for such period as they are in Royal Air Force Service.

Officers will be granted commissions in the General Duties Branch of the Royal Air Force as Flying Officers. The Air Council reserve the right to dispense with the services of any officer who is reported as not being likely to make an efficient Royal Air Force officer during his period of instruction. Such officer would automatically revert to his status in the Regular Army Reserve of Officers.

During this period officers may wear either Royal Air Force uniform or the uniform of their former service. On completion of their course of instruction they will be required to wear Royal Air Force uniform, and will be paid an allowance of £25. Officers will be eligible for promotion in the Royal Air Force in which force promotion is by selection. They will also be eligible under certain conditions for transfer to a permanent commission in the Royal Air Force; such transfers are, however, necessarily made very sparingly.

Officers who held the substantive rank of Lieutenant in the Royal Navy or Captain in the Royal Marines or the Army will be eligible for the grant of honorary rank as Flight Lieutenant if recommended by their Commanding Officers at any time after completing their training courses.

Officers will receive the pay and allowances of their substantive rank in the Royal Air Force, and will be eligible under Air Force regulations for terminal gratuity at the rate of £75 for each year of service on their short service commissions.

Officers will be allowed to enjoy the benefits of any gratuity drawn by them on retirement from the Royal Navy, Royal Marines or Army without any deductions from their Air Force pay in respect of the annuity value of such gratuity. Any retired pay in respect of naval or army service will be suspended during their Royal Air Force service, but will be resumed (without any increase for further length of service) on leaving the Royal Air Force. Officers who have commuted their retired pay or a portion of it will be dealt with under special regulations.

Forms of application may be obtained by applying in writing to the Secretary, Air Ministry (S.7.) Kingsway, W.C.2.

SOCIETY OF MODEL AERONAUTICAL ENGINEERS

(London Aero-Models Association)

"Model Engineer" Exhibition, Aviation Section. Competition Results.

Silver Medals.—S. C. Hersom, flying model semi-cantilever monoplane; awarded for general excellence. C. A. Rippon, flying model compressed air-driven Farman type monoplane; awarded for flying qualities.

Bronze Medals.—S. Holton, part scale model Boulton and Paul P. 9 biplane (awarded for construction, incomplete). F. de P. Green, experimental monoplane glider.

First-Class Diploma, plus Encouragement Award.—C. A. Rippon, compressed air-driven enclosed type semi-cantilever monoplane (unfinished); awarded for experimental work.

First-Class Diploma.—C. Bayard Turner, experimental enclosed monoplane glider.

Second-Class Diploma, plus Encouragement Award.—L. G. H. Hatfull, "Bellanca" type tractor sesquiplan; awarded for ingenuity.

Second-Class Diploma.—F. de P. Green, experimental multiplane; awarded for experimental work.

Third-Class Diploma, plus Encouragement Award.—A. Whelpton, flying model semi-cantilever monoplane; awarded for flying qualities.

Encouragement Awards 20s. each.—E. Weaver, flying model semi-cantilever monoplane. C. Howes, experimental enclosed monoplane glider.

Non-members who gained awards:—

Bronze Medal.—R. E. Wilck, scale model Avro 504K.

Diplomas.—R. A. Williams, scale model D.H.10.

Diplomas.—R. Stansell, 2-, 3-, and 4-bladed air-screws.

Encouragement Award.—E. W. Haggard, pencil drawing of a model Martinsyde aeroplane.

Very little flying has been done this last few weeks, as the weather has been very unsuitable.

Our president, Dr. A. P. Thurston, is giving a lecture at the headquarters of the Society on Friday evening, January 19th.

Official Flying Records, 1922

Type.	Name.	Time	Where made.	Date.
S.P. (h.l.)	W. Collett ...	46½	Parliament Hill ...	25.9.21
S.T. (h.l.)	D. A. Pavely ...	86	Parliament Hill ...	25.9.21
S.T. (r.o.g.)	C. J. Burchell ...	45½	Parliament Hill ...	25.9.21
S.P. (r.o.g.)	W. Collett ...	33	Wormwood Scrubbs ...	30.4.22
T.P. (h.l.)	S. Munson ...	81	Wimbledon Common ...	7.5.22
T.P. (r.o.g.)	G. Herson ...	247	Wanstead Flats ...	20.8.22
S.T. (r.o.w.)	G. Herson ...	43	Wanstead Flats ...	20.8.22
T.P. (r.o.w.)	H. Bedford ...	47½	Wanstead Flats ...	20.8.22
F. (h.l.) ...	F. de P. Green ...	27	Wimbledon Common ...	17.12.22
F. (r.o.g.)...	H. Bedford ...	17	Handley Page ...	
E.T. (h.l.)	L. Gray ...	37	Wanstead Flats ...	20.8.22
E.T. (r.o.g.)	L. Gray ...	26	Wanstead Flats ...	20.8.22
G. (h.l.) ...	C. J. Burchell ...	44	Parliament Hill ...	12.11.22
P.D. (r.o.g.)	D. A. Pavely ...	70	Wimbledon Common ...	30.9.22

S.P. = Single Pusher. S.T. = Single Tractor. T.P. = Twin Pusher. F. = Farman. E.T. = Enclosed Tractor. G. = Glider. P.D. = Power-Driven. (h.l.) = Hand launched. (r.o.g.) = Rise off ground. (r.o.w.) = Rise off Water.

A. E. JONES.
Hon. Sec.

SIDE-WINDS

THE services of Capt. A. C. Burgoine, M.I.A.E., lately of the Directorate of Research of the Air Ministry, have been secured by Lodge Plugs, Ltd., of Rugby, for their technical department. For some years past, Capt. Burgoine has been responsible for technical and research work on the equipment of aircraft engines, and is generally regarded as an authority on the subject of ignition apparatus. He will be available for consultation by aero engine manufacturers who may have any special problems relating to their ignition gear, with particular reference to sparking-plugs.

In our report on the trials of the Napier "Cub" engine fitted to the Avro Bomber in a recent issue of FLIGHT, we referred to the ease with which the "Cub" was started by means of a small engine starter. This latter, we now learn, proves to be one of the Bristol Gas Starters, which we have described in FLIGHT some little time back. From the manner in which this David set Goliath on the run we think the Bristol Co. have been extremely modest in the claims published by them for the Bristol Gas Starter, in stating the size of engine

for which it was suitable—1,000 h.p. being well outside the "up to 400 h.p." mark!

THE Editor knows of a vacancy abroad for a gentleman as manager of the export department of a neutral aircraft firm. A good knowledge of languages is essential. Letters addressed c/o Editor, FLIGHT, will be forwarded.

IMPORTS AND EXPORTS, 1921-1922

AEROPLANES, airships, balloons and parts thereof (not shown separately before 1910). For 1910 and 1911 figures see "FLIGHT" for January 25, 1912; for 1912 and 1913, see "FLIGHT" for January 17, 1914; for 1914, see "FLIGHT" for January 15, 1915; for 1915, see "FLIGHT" for January 13, 1916; for 1916, see "FLIGHT" for January 11, 1917; for 1917, see "FLIGHT" for January 24, 1918; for 1918, see "FLIGHT" for January 16, 1919; for 1919, see "FLIGHT" for January 22, 1920; for 1920, see "FLIGHT" for January 13, 1921; and for 1921, see "FLIGHT" for January 19, 1922.

	Imports		Exports		Re-Exportation	
	1921.	1922.	1921.	1922.	1921.	1922.
Jan. ...	£ 4,459	£ 1,152	£ 87,128	£ 76,552	£ 2,285	£ 23
Feb. ...	2,379	567	59,829	69,129	19	1,100
Mar. ...	14	1,471	118,199	166,607	1,565	100
April...	1,370	3,846	138,983	139,995	450	5,880
May ...	3,350	2,416	59,624	167,999	1,818	4,254
June ...	5,181	816	79,713	129,137	—	14,530
July ...	540	1,039	530,628	24,405	860	—
August	343	198	111,595	88,910	—	685
Sept. ...	620	3,043	145,755	71,508	—	44
Oct. ...	4,256	633	101,567	40,225	580	90
Nov. ...	504	52	144,073	203,437	20	450
Dec. ...	950	245	116,430	159,657	2,120	—
	23,966	15,478	1,693,524	1,337,561	9,717	27,156

PUBLICATIONS RECEIVED.

Transactions, 1922. The Institution of Engineers and Shipbuilders in Scotland, 39, Elmbank Crescent, Glasgow.

Calendar, 1923. The Bristol Aeroplane Co., Ltd., Filton, Bristol.

Calendar, 1923. Petro-Flex Tubing Co., Ltd., Cassiobury Works, St. Albans Road, Watford, Herts.

If you require anything pertaining to aviation, study "FLIGHT'S" Buyers' Guide and Trade Directory, which appears in our advertisement pages each week (see pages iii and xvi).

NOTICE TO ADVERTISERS

All Advertisement Copy and Blocks must be delivered at the Offices of "FLIGHT," 36, Great Queen Street, Kingsway, W.C. 2, not later than 12 o'clock on Saturday in each week for the following week's issue.

FLIGHT

The Aircraft Engineer and Airships

36, GREAT QUEEN STREET, KINGSWAY, W.C. 2.

Telegraphic address: Truditur, Westcent, London.

Telephone: Gerrard 1828.

SUBSCRIPTION RATES

"FLIGHT" will be forwarded, post free, at the following rates:—

UNITED KINGDOM				ABROAD*			
	s.	d.		s.	d.		
3 Months, Post Free...	7	7		3 Months, Post Free...	8	3	
6 " " " "...	15	2		6 " " " "...	16	6	
12 " " " "...	30	4		12 " " " "...	33	0	

These rates are subject to any alteration found necessary under abnormal conditions and to increases in postage rates.

* European subscriptions must be remitted in British currency

Cheques and Post Office Orders should be made payable to the Proprietors of "FLIGHT," 36, Great Queen Street, Kingsway, W.C. 2, and crossed London County and Westminster Bank, otherwise no responsibility will be accepted.

Should any difficulty be experienced in procuring "FLIGHT" from local news-vendors, intending readers can obtain each issue direct from the Publishing Office, by forwarding remittance as above.